THE AMERICAN GAS LIGHT JOURNAL

PUBLISHED WEEKLY, AT No. 42 PINE STREET.

VOLUME XCVII., No. 14.
Whole No. 1,947.

NEW YORK, MONDAY, SEPTEMBER 30, 1912.

Subscription, $3 Per Year.
$4 Canada, $5 Foreign.

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Pittsburgh

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We used to build Gas Ovens with recuperators, but the serious objections to this wasteful, inefficient method of recovering heat from the products of combustion soon led us to substitute regenerators.

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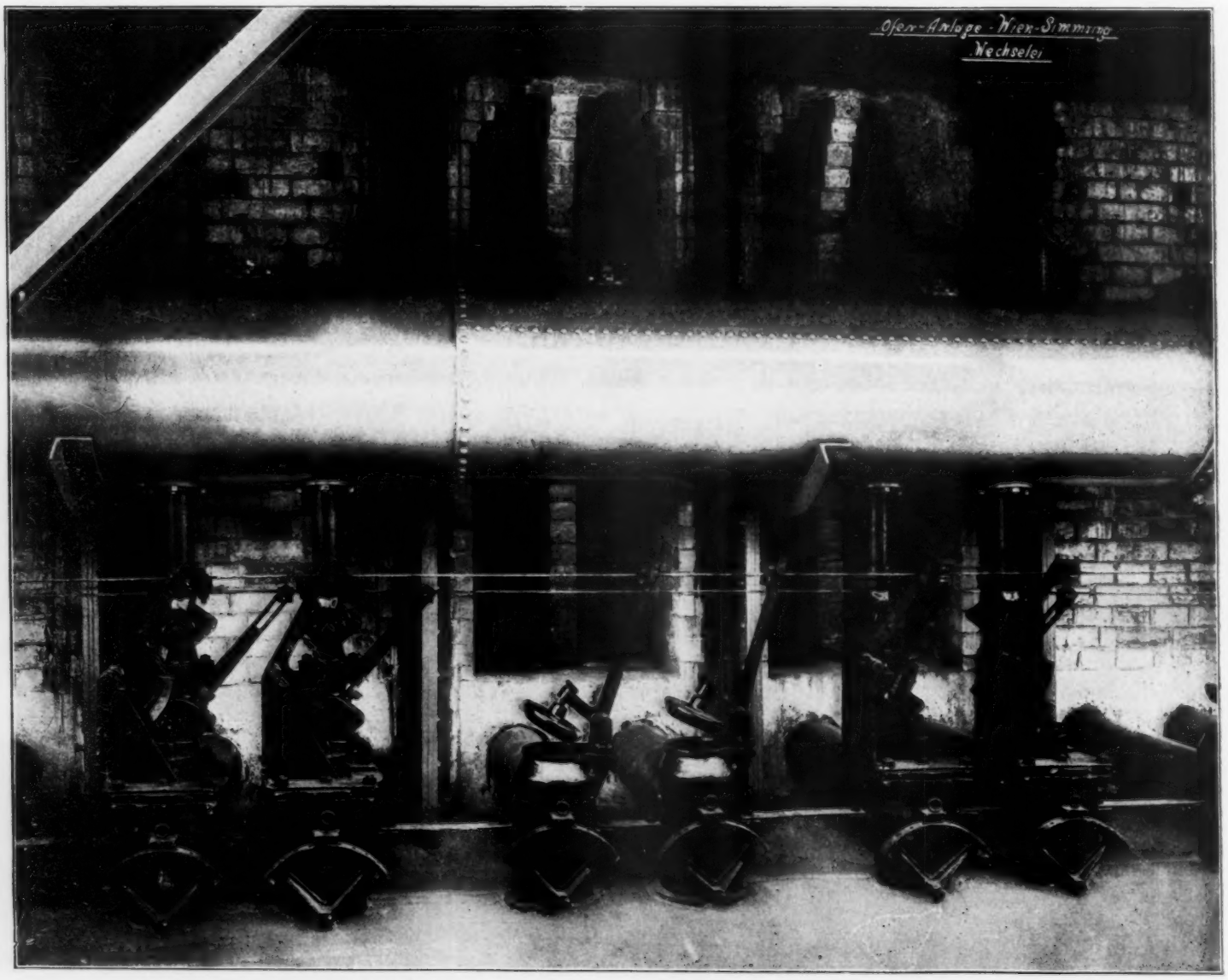
See our Brochures Nos. 3 and 4.



KOPPERS REGENERATORS—GAS PLANT AT VIENNA.

H. KOPPERS COMPANY,

CONSTRUCTORS OF HORIZONTAL CROSS-REGENERATIVE COKE AND GAS OVENS,

5 S. Wabash Avenue, - - - CHICAGO, ILLINOIS.

THE AMERICAN
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The Gas Lighting Development of a Typical English City.

[By a "MANCHESTER MAN."]

About 10 decades have elapsed since the use of coal gas as an illuminant was beginning to be general in England. The well-known London thoroughfare of Pall Mall was lighted by gas in 1807 (105 years ago), and it was the first instance of its employment as an illuminant in a public street in Europe. The only lamps then available required oil, and several of the old standards and brackets may still be found in many provincial towns, gradually rusting away. Several were taken down, close to where this is being written, two years ago. The French inventor, Lebon, was making demonstrations in the use of illuminating gas at the old Lyceum Theater, London, 1804. The present year becomes the centenary of gas lighting, through the granting of a first charter by Parliament to the London Gas Light and Coke Company in 1812, precisely 100 years ago. This Company is both the oldest and most important in Europe; it has an authorized capital (including loans) of $136,197,000; the dividends rise and fall on a decrease or increase in the price of gas, below or above the standard price of 76 cents per 1,000 cubic feet, in accordance with a sliding scale.

In 1813 and 1814 Westminster, the West End of London, was lighted with gas, and within the following 2 or 3 years it became general throughout the metropolis, and commenced to be rapidly adopted by all the large towns in Great Britain. A commencement was also made in the larger Continental towns. Manchester was among the first of the provincial towns to introduce the then new lighting system. With commendable enterprise, as early as 1804 or 1805, a cotton mill was lighted by gas belonging to Messrs. Philips and Lee, whose mill was the largest in the country, and mill owners and others visited it from far and wide. The new illuminant soon became popular, and an important and thriving gas industry was soon established. The cost of the gas at this mill was as follows: 110 tons of cannel cost $600, with, in addition, 40 tons of common coal for fuel use as required, involving a further expenditure of $96, making a total outlay of $696, from which must be deducted the value of the coke produced ($446), leaving a net outlay for materials of $250. The interest on the capital outlay was estimated at $2,640, making a gross total annual expenditure of about $2,890. How important the new illuminant was may be gathered from the fact that the corresponding cost of candles and oil at that mill reached the large annual amount of $9,600.

In the important city of Manchester, then quite a small place, gas lighting of the streets commenced with a single lamppost in a central position, a cautious and highly conservative proceeding. The Chairman of the Gas Committee (1861) said: "I well remember the sensation which this lamp produced and the crowds which night after night gathered in front of it to gaze at it, manifesting, by their eager and intense curiosity, a vague sort of impression that an element of interest was being developed that would be useful to mankind." The experiment was highly successful and the new system soon extended to both buildings and streets. The important point then rose, whether the supply of gas should be in private hands, or should be undertaken by the town authorities, the Commissioners, as the predecessors of the existing municipal authorities were called. A town's meeting was called for the 30th April (1817) to discuss the subject, and it was decided, "That it will be expedient to adopt the proposed mode of lighting the central parts of the town with gas and for the purpose of effecting this object to raise the local rates (3 pence) 6 cents in the pound." A plot of land was then purchased and the first municipal gas works erected. When they were completed gas was sold at the price of $3.36 per 1,000 cubic feet. In 1824 the first legislative recognition took place of the principle that, gas producing establishments might be erected out of public funds, and could be conducted by public bodies for the public benefit, by the passing of the first Manchester Gas Act. All was not at first plan sailing; there was an opposition, which contended that the new enterprise should be in private hands and was outside the duties of a public authority; but they did not prevail in Manchester, and at present the gas supply is the most important and lucrative of the municipal undertakings, contributing large amounts annually towards the government of the town. It may be interesting to note the progress made by quoting some figures of the spring of this year. The borrowing powers allowed by Parliament had then been exercised to the total amount of $12,654,000; a sinking fund had been created of $8,078,000 out of revenue for the repayment of the loans, and $3,637,000 had been written off the value of the plant as depreciation. The net profits which have gone towards the government of the town have amounted to $14,760,000, whilst the total value of the works, property and other assets now amount to $15,542,000. The price per 1,000 feet has come down from $3.36 to 54 cents within the city boundaries, and 60 cents outside for lighting and heating; whilst for motive power the corresponding

figures are 42 cents and 48 cents. The last annual output of gas was 5,687 millions, the annual increase being 4.82 per cent. The total quantity of coal, cannel and oil used amounted to 496,900 tons; producing 11,457 cubic feet of gas per ton, of an average illuminating power of 17.13 candles. The percentage of coal used was 80.76; of cannel, 1.06; and of oil, 18.18. There are 958 miles of main pipes, ranging in diameter from 36 inches to 2 inches, and the loss of gas by leakage and condensation is only 3.22 per cent.

The Electrical Separation of Tar from Coal Gas.

[Submitted by PROF. ALFRED H. WHITE, MR. JOHN W. HACKER[1] and MR. FRANK STEERE, for consideration at 21st Annual Meeting, Michigan Gas Association.]

The questions of the proper rate of condensation of coal gas, the proper temperature at which the suspended tar globules should be separated, and the proper point in the process at which the gas should be first scrubbed with water, have formed the subjects of many papers presented to gas associations. Practical considerations have, however, limited very much the possible scope of experiments on these points, for the only feasible means of removing the suspended tar particles has been by frictional separators, or by scrubbing, which operations can only be carried on effectively after the gas has been cooled. The question whether it would be better to remove tar from the gas while it is still hot, although it has been debated warmly, has been largely discussed from a theoretical standpoint.

Our attention was directed to the possible applications of the silent electric discharge to the purification of illuminating gas, by the brilliant paper of Dr. F. G. Cottrell on "The Electric Precipitation of Suspended Particles," which appeared in the "Journal of Industrial and Engineering Chemistry," August, 1911. In this paper Dr. Cottrell reviewed the work of earlier experimenters, and showed the successive steps of the development of his process, up to the point of successful installation of a plant precipitating the objectionable fumes from a giant smelter or the dust from a rotary kiln of a Portland cement plant.

This process claimed our attention, not only because it offered an opportunity for experimental work in a way hitherto unattempted, but also because it afforded at least a possibility of commercial application. Dr. Cottrell's figures on the amount of electric power consumed by the process were startlingly small, only 120 kilowatts being required to remove the suspended particles from a volume of gas, requiring a flue with a cross-section, 18 by 20 feet, for its passage and amounting to between 200,000 and 300,000 cubic feet *per minute*. This remarkable showing prompted us to consider whether the same process might not be applied to the elimination of suspended tar and liquor particles from illuminating gas, and experiments were at once started to determine this point. It has been possible to make only a beginning of the solution of the problem, but enough has been accomplished to show that the process offers much promise of commercial success. This paper describes the general principles of the process and gives some account of the experimental work carried on at the gas experiment station of the Michigan Gas Association and in the laboratories of the University of Michigan.

The disappearance of dust clouds under the action of an electric discharge was observed many years ago, but the credit of independently rediscovering the fact and bringing it to the attention of the public is due to Sir Oliver Lodge who, in 1886, delivered an illustrated lecture on the subject of the electrical deposition of dust and smoke before the Liverpool Section of the Society of Chemical Industry. His experiments had been previously brought to the attention of Mr. Alfred Walker, who, after experimenting on a small scale at his Bagillt smelter, installed a full-sized equipment to treat all the fumes from this plant. The only source of high-tension current available in those days was the static machine, and this plant was to be operated by two Winshurst machines with 5-foot disks, driven by a small steam engine. No record seems to have been published of the success of this project, but its failure is probably to be ascribed to the uncertainty of operation of the electric generator. Dr. Walker took out U. S. Patent, 342,548, in 1886, a part of which claim reads—"Consisting in causing the fume * * * to be subjected to a discharge of electricity from an insulated conductor situated in the flue," etc. This patent, which broadly covered the principle of the use of the electric current, has expired, so there is no basic patent on the process.

1. Holder of Michigan Gas Association Fellowship (1911-12), University of Michi an.

It has become possible within more recent years to readily obtain alternating current at any desired voltage, but it has not been so easy to obtain direct current at high voltages. Sir Oliver Lodge himself took out U. S. Patent, 803,180, in 1905, covering the use of a combination of mercury arc rectifiers for producing high tension direct current. In 1908 Dr. Cottrell took out U. S. Patent, 895,729, covering among other things the use of a rotating switch driven by a synchronous motor to rectify the high tension alternating current and the use of "pubescent" electrodes of cotton, asbestos, etc., which, by their multitude of fine points, facilitate the silent discharge. Other subsequent patents have been granted to him, and by the aid of his inventions the process has been made commercially successful for the deposition of smelter fumes as mentioned at the commencement of this paper.

Dr. Cottrell decided, with magnificent generosity, to relinquish all claim to personal profit from these patents and give them in trust that the income might be used for the advancement of scientific knowledge. Accordingly there has been organized the "Research Corporation," with nominal capital stock and a strict provision that no dividends shall be paid. The purpose of the Research Corporation as expressed in its certificate of incorporation, is as follows:

"(b) To provide means for the advancement and extension of technical and scientific investigation, research and experimentation by contributing the net earnings of the corporation, over and above such sum or sums as may be reserved or retained and held as an endowment fund or working capital, and also such other moneys and property belonging to the corporation as the Board of Directors shall from time-to-time deem proper, to the Smithsonian Institution, and such other scientific and educational institu tions and societies as the Board of Directors may from time-to-time select in order to enable such institutions and societies to conduct such investigation, research and experimentation."

Dr. Cottrell has given his patents to this corporation, which has already issued contracts for preliminary installations at several smelters and is actively engaged in pushing the work. Our first experiments in removing suspended tar particles from illuminating gas were made with a small, electrostatic machine connected to two wires, hung in a vertical glass tube, into which crude coal gas was led from a small retort. With the machine not in operation the tube filled with thick, yellow vapors. On starting the machine it seemed the glass disk had barely started to move before the tube was clear. An apparatus for rectifying alternating current was then patched up out of available equipment. The first experiments with this were made with an inverted bell jar. A wire connected to water in the bottom of the jar formed the negative electrode, a piece of flannel covering the open top of the jar formed the positive pubescent electrode. Tar vapors were led in through a glass tube. The jar, initially filled with a thick smoke, cleared almost instantly when the current was applied, and it could be seen that the fumes were being beaten down to the water. It was feared that the formation of a tar film on the surface of the water would stop the action, but this was not the case. Even when ¼ inch of tar was purposely poured into the bell jar the action continued unchanged.

Experiments were then transferred to the gas experiment station where the gas from one of the regular retorts of the Ann Arbor Gas Company was treated. The separator was ada pted from a miniature P. & A. tar separator, and consisted of an iron cylinder, 12 inches in diameter and 20 inches high. A tin can usually wound with cloth hung in the center of this cylinder and formed the positive electrode. The wall of the cylinder formed the negative electrode and was, for the safety of the operators, connected to earth. Gas entered at the center of the bottom and, rising, traversed the annular space between the two electrodes and escaped through a pipe near the top of the outer casing.

The gas to be purified passed from the retort through a condenser, then through the electrical separator and from the separator to the exhauster. It thus was heavily loaded with tar when it entered the separator. We have treated this gas at temperatures varying from 75° F. to 150° F., and have been able to so completely eliminate the tar that the gas leaving the separator appeared perfectly colorless if allowed to stream into the air and left only a faint brown stain on a piece of filter paper through which a cubic foot of gas had been filtered.

Plate I shows photographs of several of these filter papers, together with 2 for comparison, taken in the commercial plant of the Ann Arbor Gas Company. Filter paper *A* shows the effect of filtering a cubic foot of gas at the outlet of the P. & A. separator in the com-

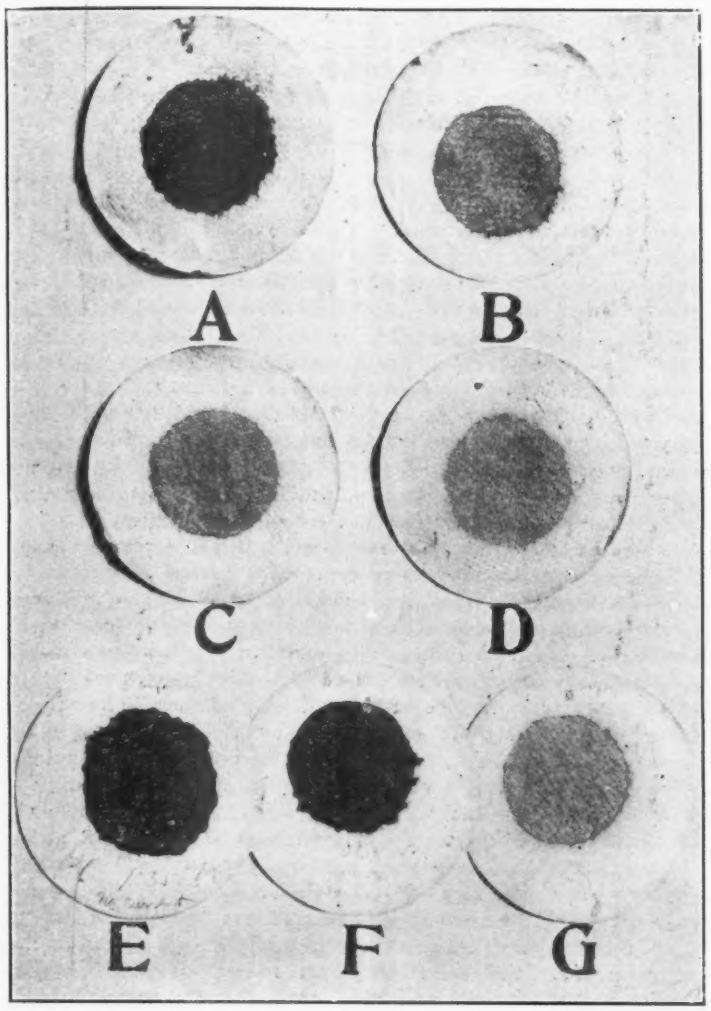

Plate I.—Photographs of Filter Papers, Showing Amount of Suspended Tar. One cubic foot of gas was passed through the paper in *A*, *B* *C* and *D*. One-third of a cubic foot was passed through *E*, *F* and *G*.

A, Outlet of P & A, Ann Arbor Gas Company.
B, Outlet of rotary scrubber, Ann Arbor Gas Company.
C, Outlet of electric separator.
D, Outlet of electric separator.
E, Outlet of electric separator (no current on.)
F, Outlet of electric separator, a few minutes later, using .06 kw. (20,000 volts.)
G, Outlet of electric separator, a few minutes later, using .1 kw. (30,000 volts.)

mercial plant, and *B* is a photograph of the paper taken at the outlet of the rotary ammonia scrubber of the same plant. Papers *C* and *D* were both taken at the outlet of the electrical separator, 1 cubic foot of gas being filtered in each case. Paper *C* was taken soon after a fresh charge of coal had been thrown into the retort, so that it represents the most difficult period for tar separation. In this case the temperature of the inlet of the electric separator was 110° F. Paper *D* was taken toward the end of the carbonization period when less tar was coming off. It will be noted that both these papers show a better tar removal in 12 vertical inches of the electric separator than was accomplished in the commercial plant by the P. & A. tar separator, secondary condenser, tar washer and rotary ammonia scrubber.

When starting a test with a clean electrode we have been able to operate the separator continuously through a full test of 5 hours. In test 92 the electric separator operated continuously throughout the whole 5 hours, with inlet temperatures ranging from 154° F. to 130° F. The charge was 400 pounds of Pittsburgh coal, and from the products the condensers separated 12.8 pounds of tar and 12.2 pounds of water, while the electric separator immediately following separated 17.7 pounds of tar and 2.8 pounds of water. This separation of tar and liquor in the electric separator cannot be laid to friction, because the separator was perfectly empty except for the electrode hanging in the center; nor can it, except to a slight extent, be laid to drop of temperature in the electric separator, for the difference between the inlet and outlet temperatures, due to air-cooling, was only about 25° F. There can be no question but that this separator, through the electric action, was almost completely freeing the gas from the suspended tar and water particles during the 4 or 5 seconds in which the gas was passing through the annular space 12 inches high between the electrodes.

We were, however, not always successful in operating the separator continuously. Sometimes the silent discharge became disruptive, when the action of the separator ceased, until the silent discharge was restored. The disruptive discharge was most apt to occur when the cloth wrapped around the positive electrode had become coated with tar. Presumably the fine hairs constituting the points from which the silent discharge occurred had become matted together.

Theoretically, the positive electrode should always remain clean, because all of the tar particles should be blown away from it, and perhaps this desirable state may be attained in a commercial plant operating continuously. Trouble was also experienced with the insulation of the positive wire as it passed into the apparatus. Rubber insulated wire, wires insulated by glass, and by successive layers of glass and paraffine, as well as other devices, were tried. None of them were entirely satisfactory. Leakage of the current could always be detected; sometimes it became excessive. Most of our time has been devoted to a study of proper form of electrode and to proper insulation.

The power required to operate the electric separator cannot be given with any certainty. The transformer with which most of our experiments were made was in bad condition and required about .25 kw. for its excitation. It was not possible to detect with certainty any difference in the readings of the wattmeter on opening and closing the high tension switch leading to the separator. More recently we have acquired an auto-transformer much better suited to our work. Some idea of its operation may be gained by filter papers *E*, *F* and *G* of Plate I., which show results obtained by filtering ½ cubic foot of of gas in each case. *E* represents a paper taken at the outlet of the separator when the gas was passing but no electricity was being used. *F* represents a paper taken a few minutes later when the input into the transformer was .06 kw. and the instrument was set for 20,000 volts. *G* shows a paper in the same series with .10 kw. input and the transformer set at 30,000 volts. To obtain the amount of power actually used by the separator we should deduct from these figures transformer loss and leakage. The latter is undoubtedly high with our present installation.

Our knowledge of thet heory of this electro-deposition is not sufficient to enable us to make any calculation as to the amount of power theoretically required. The suspended particles in some way acquire an electric charge, possibly through the condensation on their surface of gaseous ions formed by the silent discharge. The particles thus charged are swept to the electrode of opposite polarity and deposited there. It will be seen, therefore, that the process requires a unidirectional current. If an alternating current is used it is not without effect, for there seems to be a coagulation of the suspended particles which gradually become large enough to settle through gravity. To obtain effective results a high-tension, direct current must be used and the apparatus must be so arranged as to obtain a silent and not a disruptive discharge.

With a knowledge that almost complete separation of particles of tar and liquor suspended in coal gas can be obtained in a single electric precipitation, and the success of the electric process of removing smelter fume on the large scale, small expense demonstrated, it is well worth while to carry the experiments further. If the complete removal of tar at any desired temperature can be assured there will follow fascinating possibilities of increased economies in condensation, much less expensive plant, better ammonia liquor, freedom from naphthaline stoppages, longer life of purifying material, and richer gas.

Increasing Sales of Gas Appliances by Special Campaigns.

[A paper prepored by MR. PHILIP BUCKLEY, for 21st Meeting Michigan Gas Association.]

The new business department of a progressive company is working steadily and industriously at all times to secure new consumers and increase the number of gas consuming appliances in use by its regular consumers. Soliciting the installation of piping and services for new consumers and the sale of gas stoves are usually confined to a list of prospects selected from the company's records, especially if the territory served by street mains is reasonably well saturated by users of gas for light and fuel.

Special selling campaigns of gas consuming appliances, that may

be introduced and demonstrated universally to all consumers by a house-to-house canvass at periods of the year, when they are most in demand, is proving a very effective method of popularizing the use of gas.

These campaigns may be conducted by the permanent company salesmen or temporary salesmen specializing on some one appliance. With the companies operating in the smaller or medium sized territories, the work should be carried on by temporary men, as it is well to carry out a campaign without interfering with the regular work of the sales department. And, by covering the territory in a comparatively short period of time, the salesmen get the benefit of special advertising used for the occasion.

When temporary salesmen are employed great care should be exercised in selecting them. If it is possible to secure men who have had experience in this line of work, the sales' manager may consider himself fortunate, as the greatest problem contributing to the success of the campaign will have been solved. In case no such salesmen are available, it is best to take one or more experienced men, according to the size of the territory to be worked, and place them in charge of the work. The new solicitors can then be instructed in the matters of installing adjusting and demonstrating the appliance to be sold. After this has been gone over thoroughly, and the contracts, terms and condition of sales explained, the student solicitor should be sent out in company with the experienced man, to see how he will meet the consumers, and how he conducts a sale or two, then he is ready to start out for himself with the company solicitor staying close by in the vicinity so he may be called in if needed. After the student has made a few sales he will gain courage and be able to depend on his own resources.

In case of experienced salesmen who specialize on the appliances to be sold, and have been secured especially for the campaign to work on a commission basis, the burden of responsibility rests with the manager of the new business department for their conduct in meeting and dealing with the public as the company's representatives. You must make them feel that they are a part of your company while they represent you. To accomplish this, have a thorough understanding as to the necessity for all orders being properly signed by the purchaser before being turned in to the company's office, and make them responsible for the operation of the appliance in its adjustment to the consumer's service. Encourage them, especially on the start. If you give them the benefit of a few inquiries that come in to the office as a result of the advanced advertising, even if they do amount to the same as orders, you will make them feel that the campaign is going to be a success from the start-off, and the commissions turned over to them on these orders will earn a handsome return by putting enthusiasm into the salesman. Make them feel that they have your confidence and that you are interested in them.

It is best to give the special salesmen all inquiries received during the campaign and not have the company's regular men infringe in any way on their work. In doing this you not only treat them fairly, but you make them willing and anxious to give you a successful campaign. The writer believes that the temporary salesmen can be made to become interested enough in the work to eliminate the use of an inspector to follow them up. This was carried out successfully in two campaigns this year, one on the inverted light, where the salesmen installed all the lights; the other on gas flat irons. Where complaints were received from lights or irons installed by special solicitors, lists were furnished of consumers complaining, and the solicitors were instructed to call and adjust complaints; the company's men taking care of only the calls that came in several days after the installation when the salesmen were soliciting in a different part of the city. The writer believes this is preferable to having an inspector following them up, as it makes the salesmen more careful and promotes a greater interest on their part. The best method of getting a salesman interested in his work is to take an interest in him and you will keep in touch with his work. If you should happen to engage men that are not worthy of your confidence you should soon find it out and act accordingly. Remember that they are working for the commission, and if they are doing well on a commission basis you are profiting equally, if you adjust and grade the amount of the commissions on a basis so that they will furnish an incentive to automatically get just the results you want. Then, when they realize that an interest is taken in them by the company, they will represent you in a more creditable manner. Always be ready and willing to give them the credit due them, for it is well to remember that, even though they are getting paid for their work, they are doing you a good service if they cover your city thoroughly and capably.

Never allow an appliance to be placed on trial beyond a reasonable time during a campaign. Instruct the men that the company stands back of all appliances sold by them and that they are guaranteed. The difference between placing an appliance on trial and a guarantee is that at times consumers will tire of an appliance after the novelty has worn off, especially when they have an extended time to pay for it, which is the case in the majority of campaigns, and will return it by saying it is not giving satisfaction. Whereas, if guaranteed by the company, it is its duty to keep it in working order, and as long as that is done the consumer has no excuse to return it.

Great care must be taken to have all sale contracts signed in the purchaser's own handwriting. Do not allow salesmen to sign for them, even if they are requested to do so. It is a good plan to have the solicitors check up each morning on the appliances taken out of the stock room the previous day turning in all material not represented by sale contracts before taking out a new supply for the day. The new business manager should inspect each day's sales before they are turned over to the accounting and collection departments. A suitable contract in triplicate form should be used, printed preferably on different colored paper than the company's regular bills.

Where the campaign on appliances sold proves successful, there will be more than enough orders come in after it is closed and the solicitors are gone, to offset the number of those who do not keep their appliances. When a gas company decides to start a campaign, several questions of importance to its success will have to be decided.

It is hardly necessary to mention that the best appliances should always be dealt in. Each company will sell what it believes to be the best. Do not attempt to put an article out that you cannot *guarantee*, for by so doing you will lose the confidence of the public. Every gas man appreciates what that means. Always be willing to take back an appliance that is not giving satisfaction. If a customer complains do not hesitate to give his complaint your personal attention. No other method is better to increase your sales, for they are sure to tell their neighbors. If the appliance is a new one, or some improved type of a burner or appliance of any kind, it should be first put to a good test, both in the company's office and out on the mains, to ascertain the adjustment of orifice and mixers to your gas and pressures. Then will come the question of purchasing a stock to suit the requirements of the campaign. This will be the most perplexing of all the problems, especially if they have to be shipped from a great distance. The new business manager and the purchasing agent will have to rely on their best judgment and profit by previous experience in settling on this. However, it may be better to pay express charges on a small quantity to fill in in case of delay in shipments sent by freight than to have a large stock left on hand after the campaign has closed. Next, secure your men or delegate some of your regular men to the work, and while they are going through their training preparatory to starting out, announce to your customers that a selling campaign, on whatever the appliance may be, will start on a certain day and date. Make this a specially attractive "ad.," using cuts of the appliance, and announce the price and manner in which payments may be made with the gas bills.

The benefits derived from special campaigns, conducted on these lines, are gratifying, both during the campaign and aftewards. The result of one campaign was the placing of over 300 inverted lights in the 4 months following the close of a campaign, proving conclusively that the sale of one or more appliances in a household creates, in many instances, a desire for the further installation of similar appliances. It is also the opinion of the writer, and has been his experience, that these campaigns serve as the best sort of advertising for sale of other appliances at a later date, which, if for nothing else, makes them worth while.

The Rejuvenation of Gas Lighting Fixtures.

[Prepared by Mr. Will W. Barnes, for the New Jersey State Gas Association, Sept. 21.]

We know that to rejuvenate is to cause anything old to become young again. Since to render anything young the object must be old, therefore, the rejuvenation of gas lighting fixtures is to substitute the modern for the old; yet, as a convention topic, it has scarcely been considered.

Much thought and effort have been exercised by gas interests everywhere in order to serve their consumers, in all ways possible, by supplying them with every modern appliance for comfort and convenience in the use of gas for light, heat and power. Methods and

appliances in common use to-day were unheard of 10 years ago. To my mind we have progressed with the times in every way but one, and that one is the one which brought the subject of this paper for your consideration.

One has only to observe in his everyday walks the possibilities in the rejuvenation of gas lighting fixtures, both for commercial and domestic use. In my travels in many cities during the past few months I have carefully observed that here, there and everywhere the condition was the same; and I must say it is one unknown in any other field.

Carpets, furniture, etc., wear out and are from time to time replaced with new. Painting and redecorating are done. New woodwork is substituted for the old and decayed, but the gas fixture, once installed, seems intended for everlasting use. Everywhere one sees in use gas lighting fixtures of antiquated design, and the "antique" finish due to dirt; no thought evidently having been given to the replacing of this necessity for something up-to-date, something pleasing to the vision and useful in its place. Look about you. In passing the average store or dwelling be curious enough to note the character of the gas lighting fixtures in use.

Here is a subject of great importance from a new business standpoint, for it embraces the factory, the store, the home and other fields. The possibilities of results in all these fields are beyond estimate. Whether it be a tenant or a property owner, the matter of replacing antiquated gas lighting fixtures with others of modern design, if intelligently presented, is sure to be interesting. The person once converted on this subject, be he or she a tenant, will do good work for you all, insisting when renting property that the subject of proper illumination be given as much consideration as the other details.

You are dealing with a thinking public. A public who will give consideration to a subject if it is intelligently presented to them. Don't let our electric friends catch us napping. Fixtures are rejuvenated by a great many tradespeople every 12 months, and these are nearly all electric. Look in the windows or stores of the up-to-date clothier, druggist, shoeman, etc., and you will find in use the most recent designs on the market. If this can be done by our electric friends, why can't we do it? It is simply a matter of education on our part of convincing Mr. Consumer that his present equipment is not in keeping with the general charater of his surroundings or the general illumination needed.

How many of you can call to mind a consumer changing an antiquated gas fixture for one of modern design. Why does this condition exist? I know of only one answer; and that is, education in this matter has been entirely neglected. Carry your mind to your own home. What character of fixture is installed there? Is it like many thousands of others? The fixture that has been in use for years, one that has never been repolished nor relacquered, one with "the Cherub" or "the Dove" gracefully looking down on you with an appealing look, and almost exclaiming, "When, oh! when, do I come down?"

Successful campaigns have been carried on in many cities where the sale of Reflex lights was amazing. You succeeded in these campaigns because the thinking public were convinced that the something you wished to sell them was intended for their comfort and their benefit. Every lamp that was sold had to be installed on a fixture to give the desired result. Has the thought ever entered your mind what was the general appearance of this installation? Picture it to yourself; I need not describe it; your own observation will answer the question. With the same effort expended on the sale of an attractive fixture, or with the same lamp properly connected with a bypass, you could have accomplished much in awaking your consumers to the need of new fixtures as well as burners. I am convinced this can be done. You will deal with the same thinking public on this proposition that you did with the Reflex lamps. You can instill into the minds of your consumers, in a clear, comprehensive way, the comfort and the satisfaction of living under a fixture of neat and attractive design—in the home at least, with your modern mantle lamps properly attached. That desire once created yours will be the satisfaction of having rendered a service that brought light and joy to the household, for you well know the happiest hours of family life are those spent together after the evening shadows fall.

The possibilities of factory lighting with modern methods are unlimited. It has been my privilege to inspect many installations of "unit lighting" in factories in New England, which have been of great benefit to gas companies, and most satisfactory to the manufacturers who had the comfort of their employees at heart. By giving the employees satisfactory conditions to work under their work was better accomplished.

Many other fields are open to us. The more we look into this subject the more positively do we see the field growing broader. We must awake the public from the deep dream of sleep that has held them so long. We must convince them, when a gas fixture is installed, it was not intended to last until the last trumpet sounded. Your field has been either new homes or old homes that had not been piped for gas in the sale of fixtures. Start now and add to your field of effort, those who, having enjoyed the comfort in the use of gas for years, should now enjoy the decorative effects in modern lighting which are within the reach of all. You may say, while the field of effort may be good for the property owner, it won't apply to the tenant. In answer to this I will ask the question, what becomes of the thousands of gas domes that are yearly sold to and installed by tenants. If they will purchase a dome for a dining room, why not a modern fixture for the library, the living room, etc.

Again, I say, if you carry on a campaign of this kind the results will well repay you. Look at what has been done in this city in the way of modern gas lighting in the hotel, the store, the home. While many gas arcs are ablaze, you will also see in many hotels inverted gas fixtures carrying the latest improved inverted lamps. You will note an abundance of combination fixtures, wherein gas is given an even chance, and I think you will find in many instances the gas in fixtures of this kind will be burning. Take this lesson home with you, and, during your idle moments, ask yourself if combination fixtures belong in the showrooms of gas companies. Here is your proof.

Who will say that gas as an illuminant has seen its days? Don't be deluded. We can give as beautiful an effect in gas to-day as our electric friends can give. We can supply a better, a more pleasing and a more mellow light than electricity was ever known to give.

Carry away with you to-day one thought, that is to rejuvenate the fixtures in your own showrooms, if you have not already done so, and be an example for your consumers to follow.

The Public Service Gas Company, of New Jersey, and its 400,000 Consumers.

In an address made to the "Gas Meeters" (First Annual Meeting, Friday, September 6th, in the "Downtown Club"), after having paid a visit to the new Public Service Building, Jersey City, N. J., Mr. Ormsby F. Potter said:

I have been asked to address you, gentlemen, of the "Gas Meeters," on the subject of "The Public Service and Its 400,000 Consumers." We had the pleasure this afternoon of visiting the magnificent home of the Public Service, Hudson Division, on Jersey City Heights, and as I went through the building I was reminded very strongly, through comparison of its location with that of the office in former days, of the expression that Cecil Rhoades, the great South African empire-builder, was so fond of using and keeping constantly before him. That expression was, "Get on higher ground." The Public Service in this Division, while literally having gotten on higher ground, is merely typifying what is actually taking place in every department of that great organization.

I believe it would be only fair to give you, gentlemen, a slight idea of the extent of the business of the Public Service Gas Company, to tell you that its territory extends from the New York line, on the north, through the thickly settled metropolitan district, across the State, down the Delaware river to Woodbury, in South Jersey. This territory is, as the crow flies, about 110 miles in length, and its greatest width, from Trenton across the State to South Amboy, is about 50 miles.

I do not wish to tire you with any detail of the organization of the Company, but will say that it is divisional in its physical parts, the northern part of the State holding the Passaic Division, taking in Passaic county, and including the cities of Paterson and Passaic. The Bergen Division, which includes Bergen county and the thriving towns of Hackensack, Rutherford, Englewood, Ridgewood, and their environs. The Essex Division holds Newark, the Oranges, Montclair, Summit, Morristown and Madison. The Hudson Division takes in the cities of Jersey City, Bayonne, Hoboken and the collection of municipalities that include the towns of West New York, Weehawken, Union Hill, Guttenberg, etc. The Central Division, so called because of its location in relation to the other divisions of the Company, includes the towns of Plainfield, Westfield, Bound Brook, Somerville, New Brunswick and South Amboy. The Southern Divis-

ion embraces the towns of Camden, Trenton, Burlington, Gloucester and Woodbury.

The territory above described holds a population of approximately 2 millions people, representing on our books 400,000 consumers. The territory, made up of a homogeneous people, is largely residential in character. Our manufacturing centers are in the vast cities of Newark, Jersey City, Paterson and Trenton, all of which show great activity in their industries.

The Company, in its policy with the public, endeavors to meet these 400,000 customers by making them feel that their needs must be met by us, and it is to this end that every effort is bent, and it is of this that every employee is thinking. The Company is comparatively young, having been organized June 1st, 1903, but from its inception it has enjoyed phenomenal success, resulting undoubtedly from its broad policies and liberal treatment of the public.

With few exceptions, the Company is made up, from its chief executive, through all the administrative departments, of young men, and the highly efficient methods of the young man in business to day prevail throughout this Company. No opportunity is neglected, no suggestion, no matter how humble its source, is ignored, to further the efficiency with which it may perform a public service; and, to again return to the original remark, to "Get on higher ground." While the road to higher ground is always hard to travel, yet we are constantly going upward, raising our standards; and, I am glad to say, gentlemen, these efforts are not passed by unappreciated.

We have improved the local conditions by concentration; we have made our business homes more beautiful; and we are continuing to do this so that in a very short time we may hope to have, without exception, an absolutely up-to-date office building in every one of the towns in which we are operating. As you saw to-day, in your visit through the showrooms and offices of the Jersey City district, so you will see in all our towns. We are doing this because we believe that good results can only come from a prompt recognition that we must give our employees proper facilities if we expect to get good results.

All this is brought about, as I intimated a few moments ago, through the concentration of thought in men, expert in their line, having charge of our departments, with an eye single to the welfare of the public, the Company and its men. Gentlemen, you who are representatives of manufacturing interests, closely allied to the manufacture, sale and distribution of gas, can appreciate, I am sure, what this means to you in making the sale and use of gas burning appliances more valuable to the public, because of our exceptional opportunities to present these same articles in a most favorable way. Our showrooms are kept "spick-and-span," the appliances themselves are always seen at their best, and we are using every effort and expending large sums of money in introducing and popularizing the use of your appliances in the various fields of work.

Our plans of showing lighting mediums under proper conditions are bound to influence the buyer to cause him to become much sooner a consumer of gas than in the old days when things unattractive were offered to him for sale. To-day we are showing our merchandise in such way, and with every facility to demonstrate it, that, with the corps of efficient new business men and representatives, we are growing and have grown from approximately 200,000 customers (1903) to 400,000 at the present time, and it is a peculiar fact, or I might better say, a fact peculiar to our business and to yours, gentlemen, who sell appliances, that it is rare to find any article on our floor that does not bear the name of the manufacturer standing out very prominently. It is by the name of the manufacturer and by the trade name, adopted for the article, that the customer is largely influenced. We are selling your goods, gentlemen, by the names that you have given them, and, in putting these goods before the public, we have set our seal of approval upon them, and our willingness to stand behind them is evident.

This brings me to the fact that, within our organization, the purchasing department is guided in placing its orders, first, by the quality; second, the price. The old-fangled idea that the purchasing agent pounds the salesman down to the last penny to buy at a rock-bottom price, is not, I am sure, the attitude that the buyer of to-day assumes. And I know that we are anxious, first, that, securing the best article of its kind, we proceed to consider the price. We stand behind the goods we sell, and it is to our interest to make the customer feel and know, when we show an article upon our floors, that is the best of its kind, and will give the minimum amount of trouble. In this department, as in others, we are proud to say, we are operating upon a very high plane.

We are selling gas to-day for $1 per 1,000, net, throughout our many districts, and find, by making the price right, affording the customer every facility for speedy execution of his order when placed, the attentiveness of our employees and politeness under all circumstances with the public, the due regard for the feelings of the individual, and by presenting to him everything that is new and good in the business for his use, we have achieved a point considered by efficiency engineers as one of the great essentials in successful business management; we have satisfied our public.

There are other points that men, who have given much thought to the subject, consider necessary to the carrying out of business enterprises. It has been considered essential that a business be operated successfully from the investor's standpoint. This, I can point with pride to as being the case with Public Service. It has also been considered, that, to make the triangle complete, a third side is necessary. And that is labor—the men who work for us—must be considered; and I am proud to say that Public Service has taken the initiative in this direction. We have had in effect, since the 1st of January, 1911, a welfare plan, supervised by a Welfare Committee, that provides a very extensive system of benefits to the individual, arranging for a sick benefit paid to the man while ill; a death benefit, should he die while in the employ of the Company; and a pension allowed to men who have grown old in the service, or who have been in the employ of underlying companies that have been taken in from time-to-time.

This welfare plan is carried on by the Company solely, and is not organized along co-operative lines. The men do not bear any part of the burden of this payment, and when I tell you, gentlemen, that in 1911 a sum approximating to $48,000 or $50,000 was paid out, you will realize its extent. This pension and its sick benefit system, along with the insurance feature, has brought about a splendid feeling among the men of our Company, and I am sure that, could those who are at the head of the organization, and who, in their broad and far-sighted way arranged for this plan, now hear personally the expressions of appreciation by the men of the Company, they would feel amply repaid. I know the Company feels amply repaid by the loyalty and willingness of these men to stand by in times of trial.

Arnold Bennett, one of the writers having the greatest vogue to-day, on a recent visit to this country, was impressed by many things; so he states in some of his interviews. He was not disappointed, and felt that the actuality did not fall short of what he had been led to believe existed in this country. He found the hustle-and-bustle of the American business man a thing of fact. He found business developed to a high degree of efficiency; and in his visits to the larger cities, and in his meetings with prominent and successful men, he was compelled to observe that the large business organizations of this country were indeed working along a very high plane. And the social engineering feature, that is now being recognized as one of the most important features in the relations of capital and labor, had been perfected to a high degree in many of our large enterprises. Mr. Bennett states he was very much impressed by this feature, which had been introduced and developed by large business houses, and found the one great illuminating thing that, I believe, should not be lost sight of, the sort of thought that is behind this great movement.

The American business man, the various companies, and this Company in particular, were not entirely utilitarian in providing these various methods whereby the "man before the mast" receives benefits. The restaurant feature, which we have in our main office building, similar to that conducted by others having large clerical forces to handle, is not utilitarian entirely; but it does represent a humane thought, or, I might better say, a thought by a man who was human; and the love of man should not be entirely lost sight of, because we sometimes feel that the utility of the project was its main object. "Man's inhumanity to man" should be rejected with such movements as this, characterizing the business world to-day; and I believe, that when you realize that the employees of this vast Company, in its various lines numbering 10,000, represent one out of every 50 in the population of New Jersey, you will agree with me that no better advertisement or better means of bringing about satisfactory results can be had than by having these men satisfied, as we know them to be. There can be no better advertisement than a satisfied customer, and there can be no better means adopted to satisfy a customer than to be sure that your help is loyal and satisfied.

We occupy a field that is practically in its infancy, as far as its development is concerned. Physically we have space to take care of all the present population of New York, and many more besides. Our territory in spots is congested, but we are in our infancy as compared with what will come later, and with the possibilities that this same territory holds out for us. But we cannot expect in doing this

business to secure it for ourselves alone, if we do not continue to maintain the satisfactory relation with the public and with the employee. To get results from the investor's standpoint, the public must get what it wants and the employee must be regarded as human

We are trying in New Jersey to do the best we can. We are willing to learn, and to this end we welcome at all times the suggestion from the customer and salesman. We want to do the best, sell the best, and achieve the best; and it is by co operation, one with another, that we hope to bring about these results.

Management & Commercial Methods.

INDUSTRIAL EXHIBITION, GAS AND ELECTRIC DISPLAY, JERSEY CITY, N. J.—Beginning with the week of October 7th, the Public Service Gas and Electric Company will give an exhibition and demonstration of Industrial Appliances at and in its beautiful new building, 84 Sip avenue, Jersey City. A week before, and during the time of, the exhibition, the Company will keep the public informed, through the newspapers and other mediums, of the fact that such a demonstration will be held, and full publicity will be given the plan.

The entire week will be given over to the manufacturers, architects, builders and contractors, and all other merchants in the industrial field as well, who will be given an opportunity to visit and inspect the many and various up-to-date gas appliances on exhibition in the Public Service Company's display room. The exhibition itself will begin at 10 o'clock each morning, and last until 9 each evening. Among the well known exhibitors and demonstrators will be the following:

American Gas Appliance Co.	General Appliance Co.
American Laundry Machine Co.	General Gas Light Co.
Beach-Russ Co.	Kane Mfg. Co.
Bless & Drake Co.	Oven Equipment Co., New Haven.
Chicago Dryer Co.	Pittsburgh Water Heater Co.
Chris. Schmitt Mfg. Co.	Simplex Co.
Crandall-Pettee Co.	Straus Gas Iron Co.
Emil Steiner, Oven Mfrs.	Welsbach Co., of Gloucester.

And other prominent manufacturers. The Public Service Company will also specialize in sending out invitations so that those interested in any particular industry will be invited specifically, to see the appliances they are especially interested in. Each of the concerns listed represent the largest manufacturers of their lines in the country and will have their experts at the disposal of the public to demonstrate the entire week, also their literature will be freely available for distribution to the public; but such literature will give the address of the Public Service Gas Company as the distributing agents for the appliances listed in the various catalogues, etc.

It has been said by the general gas fraternity at large that the Public Service Company probably has one of the largest and most up-to-date display and exhibiting rooms in the country, and this should afford the manufacturers a fine opportunity, as well as the gas men, to spend a most instructive and profitable week, not only to view all the appliances in actual operation, but to inspect a model office building and show rooms.

The gas building itself is located in the center of the city, being situated at Sip and Summit avenues. It can be reached by any of the car lines throughout Hudson county, for they pass the door. It is also situated at the entrance of the Sip avenue station of the McAdoo Tubes.

THE PHAROS AIR PPESSURE GAS LAMP.—Prepared for the JOURNAL by Dr. Leonard Keene Hirshberg, Johns Hopkins, Baltimore, Md. In recognition of the success which has followed the introduction into Marseilles, Bordeaux, Paris and other European cities, of a high-powered incandescent system of gas illumination, Mr. McCuen, the Commissioner for Lighting Streets in the city of Baltimore, has planned a trial of the new method in the Monumental City. The old scheme now in universal use is dependent for increased gas light upon numerous extra burners, while the French system, on the other hand, involves the use of increased pressure of either or both air and gas and the laying of special mains containing air under high pressure. These mains run parallel to the others, the gas being sent through at ordinary pressures.

This combination gives a much higher candle power at the burner, and at the same time permits more gas to emerge from the tip. Thus the gas light easily equals in brilliancy and intensity the electric arc. Economically, it is claimed abroad, the new combination of gas and compressed air gives the luminosity of an arc at a cost only a little above the ordinary gas mantle.

In Paris they have already extended the new system throughout the Boulevard de l'Opera, the type of lamp being a cluster of 3 inverted burners. Each group of three emits a candle power of 1,500, raised 20 feet above the roadway. An automatic stopcock and button arrangement reacts spontaneously to certain pressures within the central gas station, thus extinguishing and also turning on the gas burners without the need of city lamplighters. A few inspectors are employed, however, in order to cut out and repair any injured or defective burners, and this exigency is met by providing all lamps with separate valves and keys for lighting or putting them out when necessary.

The inspectors also clean the lamps and examine them twice each week. At inspection times new mantles are adjusted and broken globes, if any, are replaced. An idea of the saving from the use of such lamps may be appreciated, if 5,000-candle power be taken at 11 cents each cubic foot. This means 16 cents an hour, or in winter about $1 a night per lamp. For an equivalent 5,000-candle power arc lamp, the cost each night, with electricity at 70 cents an hour (5 kilowatt hours-times-14 cents), the city must pay $7 for each arc, or 10 times the cost of the high pressure gas lamp.

Thus it is evident that great changes are in store for all first class municipalities and their street lighting systems; for no city will continue long to spend 10 times as much for a necessity such as the illumination of her thoroughfares, when there is ready to hand an automatic, mechanical, air-gas pressure system that can be, without interference with her other arrangements, brought easily and cheaply into practical use.

EDUCATIONAL WORK, GAS DIVISION, CONSOLIDATED GAS, ELECTRIC LIGHT AND POWER COMPANY, BALTIMORE, MD.—Prepared for the JOURNAL by Mr. H. K. Dodson.

During the winter of 1910-1911, our plan of educating the employees of this Company was in the way of inter-department educational talks. The employees were divided into groups of 20 men, who reported each week to one of the superintendents for a lecture on the work under his supervision. In this way the employee was given a thorough knowledge of the workings of the various departments.

During the past winter, however, the educational talks differed from those of 1910-1911, in that the subjects of the talks were confined to the particular work which the employee pursued, although he received invitations to attend the talks given in the various parts of the organization. The men were divided into groups of 10, as it was found that a talk delivered to a small group of men was more effective than one delivered to a large number; and, in order to expedite the course, the sub-heads of the departments assisted in the delivery of the talks by lecturing on the particular work with which they came in contact.

Then, too, meetings were held of the heads and sub-heads of each department, during which the subjects that were to be presented to the employees were discussed and a report of the meeting conducted by each sub-head given to the head. The head, in turn, sent to the Vice-President each month the proceedings of the various meetings conducted in his department during the preceding month. Among the subjects discussed at these educational talks were:

"The Essential Points in the Efficient Manufacture of Water Gas."
"Repairs and Machine Shop Management: The Importance of Details Relative Thereto."
"Distribution Matters."
"Street Department Matters."
"Meter Installations."
"Gas Service Work."
"Main and Service Reports and Records."
"The Issuance and Handling of Orders."
"Advertising."
"Functions of the New Business Department."
"Industrial Gas Appliances."
"Practical Demonstrations."
"The Gas Engine."
"New Buildings: Extensions of Mains and Services."
"Sales."
"Duties and Responsibilities of the Auditing Department."
"Statistical Analysis."
"Auditing and the Effect of Errors."

(*Continued on page* 218.)

THE AMERICAN GAS LIGHT JOURNAL

Entered at the Post Office, New York City, as Second-Class Matter.

Published weekly at 42 Pine Street, New York City.

Telephone Call, John, 2996. Cable, Am-Gas.

A. M. CALLENDER & CO., - - Proprietors.

THOMAS J. CUNNINGHAM, ELBERT P. CALLENDER, } Editors.
H. THURSTON OWENS, - Associate.

CHARLES H. WADELTON, Manager.

Agents—American News Co., 11 Park Place, New York City.
Lemcke & Buechner, Berlin, Germany.
Aug. Siegle, 30 Lime Street, London, England.

TERMS OF SUBSCRIPTION.

United States, Cuba and Mexico, $3 per year. Canada, $4 per year. All other countries, $5 per year.
Single Copies, 10 Cents.

NOTICE TO ADVERTISERS.

New Advertisements and changes of copy therefor should be in hand Wednesday noon of week prior to date of issue.

NEW YORK, MONDAY, SEPTEMBER 30, 1912.

[NOTICE.]

Tentative Programme, Seventh Annual Meeting, American Gas Institute.

According to the "Gas Institute News," dated October 1st, the programme (tentatively) for the Seventh Annual Meeting of the American Gas Institute, which is to be held in Atlantic City, N. J., Wednesday, Thursday and Friday, the 16th, 17th and 18th October, has been thus arranged:

Wednesday.—10 A.M. to 1 P.M.:

Address of Welcome.

Response.

Report Board of Directors (including the following reports from Committees, Regular and Special):

Technical; Membership; Secy.-Treas.; Finance.

President's Address.

Reports from Committees (Nominating; Wrinkles; Bureau of Information; Publication; Public Relations; Beal Medal; Arrangements; Affiliation.)

Wednesday.—8 to 10 P.M.:

"Public Service Commissions," by Mr. A. S. Miller.

Extracts from "Bulletin No. 32," Bureau of Standards.

Reports of Committees: (Calorimetry; Thermal Value and Candle Power; International Photometric Commission; International Uniform System of Pipe Threads; Consumers' Meters.

Thursday.—10 to 12 A.M. Section A.—Manufacture:

"Photometry of Incandescent Gas Lamps," by C. O. Bond.

"Effect of Various Diluents on the Candle Power of Oil Gas," by A. H. Elliott.

"Some Recent Developments in Gas Measuring," by E. C. Thomas.

Thursday.—10 to 12 A.M. Section B.—Distribution:

"Industrial Appliance Laboratory," by H. B. McLean.

"Utilization of Gas Appliances," Report of Committee on.

Thursday.—2 to 5 P.M. Section A.—Manufacture.

"State of the Art in Coal Gas Manufacture," by Mr. W. H. Blauvelt.

"Standardizing Carbonization Tests of Coal," Report of Committee on.

"The Value of a Weight Balance in Coal Gas Manufacture," by C. J. Ramsburg.

Thursday.—2 to 5 P.M. Section B.—Distribution:

"Small Unit Gas Engine,' by Carroll Miller.

"Effect of Cold Weather on the Gas Industry," by C.W. Andrews.

Friday.—10 A.M. to 2 P.M.

"Heat Balance in a Carbureted Water Gas Set," by O. B. Evans.

"Analysis of Water Gas Purification Material, and Determination of Tarry Matter in Water Gas Purification," by E. C. Uhlig.

"Allowed Strains in Gasholder Designs" (Committee Report).

The announcement from the Committee of Arrangements, which is signed by Walton Forstall, is remarkable for one thing, and that is the signature thereto, thereon and thereof, in-so-far as the "fare-you-well" to the announcement is concerned. The text of Mr. Forstall's communication is:

Announcement: Committee of Arrangements.—Your most pressing duty this morning, in receipt of this copy of "The News," is to tear out the advance registration card, and mail it at once. Of course, you are going to the meeting, and we will find it easier to look after you, if we get your acceptance promptly. We do not expect your "regret," as we know you read the editorial in the September "News," which showed that non-attendance at meetings was fatal to your best chances in the gas profession. Also, you have been told enough about the paper and entertainment program[me] to know that pleasure as well as profit awaits you at Atlantic City. We have been very careful not to tell all we know about the entertainment features, because we do not want to spoil the fun that will begin at the start and keep up continuously until the end. Therefore, R. S. V. P., *P. D. Q.* The italics are ours.

BRIEFLY TOLD.

AUTUMN MEETING, NEW JERSEY STATE GAS ASSOCIATION.—The New Jersey State Gas Association, now in its second year, held its fourth meeting at Atlantic City, N. J., the afternoon of the 21st inst., in the offices of the Atlantic City Gas Company. The regular order of business proceeded in the usual uninteresting manner until President Pettes called upon Mr. O. F. Potter, Chairman of the New Membership Committee, for a statement. He reported an increase in membership of 57 (from 50 to 107) or over 100 per cent. This showing is all the more remarkable from Secretary Osborn's statement that the list carries probably not more than a dozen members connected with the Public Service Gas Company, and that practically every Company in the State was represented. The first paper on "High Pressure Gas Lighting," was read by the author, Mr. R. N. Zeek, the text of which will be printed next week. The discussion, which was quite general, seemed to indicate that the subject had not received more than casual thought from many, up to the present time, but should an aggressive campaign be started by an energetic company no doubt was expressed that such campaign would be fruitful in good results. The only other regular paper was that by Mr. W. W. Barnes, and its subject was "The Rejuvenation of Gas Lighting Fixtures." It was read by Mr. H. Thurston Owens, owing to the absence of the author. The paper will be found in the current issue of the JOURNAL. Everyone seemed to agree that gas fixtures had not received the attention they deserved, and the numerous cases cited, where gas could not be used owing to the fixture construction, may cause many companies to actively attack the problem. At any rate it is to be hoped that they will and, we further hope to be able to report to our readers a number who have turned over a new leaf in this instance, say January 1, 1913. One Company is going to "do it now," and that Company is the Public Service Gas, of New Jersey, which will organize a large force of canvassers devoting all their energies to this work of rejuvenation. The business session closed with a short address, by Mr. R. F. Pierce, on the Canadian-Michigan meeting and the great annual Canadian Exposition at Toronto. Among those in evidence at the session were Messrs. F. R. Cutcheon, Long Branch; S. J. Franklin, Millville; R. H. Garrison and C. A. Crofut, Atlantic Highlands; F. E. Engle and C. C. Denton, Elizabeth; H. A. Reitemeyer, Perth Amboy; C. Butcher, Freehold; J. T. Pettey and J. T. Prendergast, Glassboro; J. P. Hanlon, Newark; L. N. Yetter, Atlantic City; I. W. Peffly, R. A. Pinkham, J. M. Brock, C. H. Baker and J. P. Conroy, New York City; J. Jones, Bridgeton; N. A. McClary, Toms River; and C. V. Roberts, Geo. Millsbaugh, Stanley Grady, Harry P. Dains, R. J. Rolston, H. C. Aiken and J. M. Dorsey, Philadelphia.

A feature of the meeting, not down on the programme, was a parade of a considerable number of multi-colored, gaily bedecked Shriners, with their formidable bands; formidable, because a recess had to be called while they went marching by. Lu Lu Temple, of Philadelphia,

was well represented among the gas men, numbered in its ranks being H. P. Dains, H. C. Aiken, C. W. Wardell, H. H. Richman, J. B. Cuthbert, Geo. Colville and J. Jones. Some 60-odd members gathered for an informal dinner, served in Haddon Hall, at 6:30 P.M., which being quickly put away, the many and varied attractions of Atlantic City were enjoyed with much gusto. Those who took a swim the next day found "the water warm" and plenty of company, even though the date was late in September. The New Jersey State Association is surely a live member.

DIRECTORS' MEETING, N. C. G. A.—At the call of President C. L. Holman, the Directors of the National Commercial Gas Association held the fourth meeting of the present administration at Atlantic City, September 21, 1912. The meeting was attended by President C. L. Holman and Messrs. C. W. Hare, Geo. W. Thomson, C. M. Cohn, H. D. Schall, C. W. Wardell, A. P. Ewing, J. C. Rushin and Secretary Louis Stotz. Mr. O. H. Fogg (Chairman of the Committee on Standardization of Appliances) was also present, by invitation. The principal topic considered was that of education and the proposed trip of Secretary Stotz to assist in forming classes.

AN ENJOYABLE OUTING OF THE EMPLOYEES OF THE BRONX (N. Y.) GAS AND ELECTRIC COMPANY.—One morning not long ago, forty-seven bright-faced, sturdy-bodied chaps gathered at the Clason Point Dock, ready for a day's fun. Waiting for the tardy ones, to say nothing about getting the refreshments on board, occupied a little time, but the anchor was hauled aboard at 9:45, whereupon the good yacht "Venturia" turned her nose toward the Sound. Weather conditions were ideal, neither hot nor cold, and no sun. It didn't take long to get things started. Some of the boys indulged in cards, others read the morning newspapers, while a piano on board soon floated through the air, music sweet to hear; for with experts like Towner and Klein on board, the keys were kept busy, and singing—(plenty of that "close harmony" variety) prevailed. Mr. William Bible (who does not altogether live up to that which one might expect from his name), local vaudeville artist, entertained all with selections on his one-string, cigar-box violin, aided by his clog-dancing doll. Later, all hands, under the direction of Mr. Bible, sang the "Schnitzelbank" song; and they could sing. Photos were taken, but the photographer has not returned the prints in time for the embellishing of this narrative. About 2 o'clock, Valley Grove, in Oyster Bay Harbor, was sighted, and all hands were nearly famished. Had it not been for the forethought of President Rosenquest, in buying out a pop-corn man at the dock, there might have been some friction sufficient to lead to casualties, of course, of a minor sort. On landing, the dinner-bell notified all that a shore spread was steaming. First a picture was taken of the famished bunch, then a quick march to the tables, and for nearly a-half hour one could hear nothing but the smacking of lips by the satisfied diners. After dinner a short game of burlesque ball was indulged in to the enjoyment of all. Some of the boys had time to take a dip in the water but found it rather chilly recreation. The trip home was enjoyable and, with "Charlie" Bahr at the wheel, of course, all landed safely, at 10 o'clock, laden with the memories of a most enjoyable day.

PEDESTAL CONCRETE PILING.—The MacArthur Pile and Foundation Company is distributing a new edition of its booklet descriptive of "The Pedestal Pile," the placing of which useful supporter is one of the Company's specialties. The general plan of the publication is quite like that followed in the framing of the first edition, save that it carries several pictures illustrative of recent work done by the Company; also, quite a few changes in and additions to the text have been made. To show its general usefulness to the contractor, we quote this paragraph, as it appears on page 61:

"Considerable saving in time and expense of installing foundations, together with more reliable design, can in all cases be assured by making complete surveys by test borings. It often happens that, when the actual work of driving piles is started, unlooked for soil conditions are found which require changes in equipment, or cause unavoidable delays of time. When complete soil surveys are not made, the contractor must protect himself in his bid, and ultimately the cost will rest upon the owner. With accurate and complete knowledge of soil conditions, exact pile places can be prepared and foundations completed without delay and at minimum cost." The "Pedestal Pile" carries much data respecting the bearing power of soils, frictional resistance, etc., together with a realistic description of the pile, its construction, and the like. The booklet should be of interest and use to every architect and engineer.

CURRENT MENTION—

MR. JAMES N. SPEAR, Superintendent Roxbury and South Boston Station of the Boston Consolidated Gas Company, has been named to succeed himself as Employees' Representative on the Board of Directors. The voting employees, who share in the profits of the Company, in the last fiscal year received an apportionment of $50,891, which sum represented a dividend equal to 9 per cent. of the salaries.

AT a special town meeting, held in Reading, Mass., the 24th inst., called for the purpose of considering the matter of a gas supply, as per the offer of the Malden-Melrose Gas and Electric Company, it was voted to accept the same. The vote was 248 to 12. Under the agreement the rate for first year will be $1.50 per 1,000 cubic feet; but should the volume taken equal 15 million cubic feet the rate shall be $1.25; whereas, should the volume reach 20 millions, the overall figure shall be $1.

THE reorganization of the Louisville (Ky.) Gas Company has been completed. The officials are: Directors, H. M. Byllesby, A. F. Huey, J. J. O'Brien, O. E. Osthoff, F. M. Stern, J. B. Brown, G. H. Harries, J. H. Whalen and W. J. Abram; President, G. H. Harries; First Vice-President, H. M. Byllesby; Second Vice-President, J. B. Brown.

MR. ALFRED FITLER MOORE, President of the Northern Liberties Gas Company, of Philadelphia, Pa., and one of the best known men in the wire rope manufacturing business in this country, died at his home, 1921 Walnut street, Philadelphia, the evening of the 18th inst. He was in his 57th year, having been born in Philadelphia the 22d November, 1855.

[Communicated by MR. H. H. CLARK, Chicago.]

Determination of Heating Value of Solid Fuels by Calculation from the Proximate Analysis.

This formula, for the determination of the heating value of solid fuels by calculation from the proximate analysis, was derived as the result of over 500 analyses of solid fuels, in which the heat value was determined by means of a standard make of calorimeter, together with other reliable data. The formula derived has given results within 2 per cent. of the calorimeter, but is not recommended for use where great accuracy is desired.

FORMULA:

$$\text{B.T.U's per pound of dry substance} = \frac{(Cc + Vv) - (Mm + Aa + Ss)}{\frac{100 - M}{100}}$$

M —	per cent.	Moisture.	m — 16.00.
C —	"	Fixed carbon.	c — See Table 1.
V —	"	Volatile matter.	v — " 2.
A —	"	Ash.	a — 30.00.
S —	"	Sulphur.	s — 39.00.

TABLE 1.

Anthracite coal	c — 141
Bituminous coal	c — 140
Lignite coal	c — 95
Coke	c — 130

TABLE 2.

Per Cent. Vol.	"v."	Per Cent. Vol.	"v."	Per Cent. Vol.	"v."	Per Cent. Vol.	"v."
1	240.5	14	202.7	27	180.5	40	162.2
2	236.4	15	200.9	28	178.8	41	161.1
3	232.5	16	199.2	29	177.2	42	160.0
4	228.8	17	197.5	30	175.5	43	158.9
5	225.3	18	195.7	31	173.9	44	157.8
6	221.9	19	194.0	32	172.3	45	156.7
7	218.6	20	192.3	33	170.7	46	155.6
8	215.4	21	190.6	34	169.2	47	154.5
9	212.3	22	188.9	35	167.8	48	153.4
10	210.3	23	187.2	36	166.6	49	152 3
11	218.3	24	185.5	37	165.5	50	151.2
12	206.4	25	183.8	38	164.4	51	150.1
13	204.6	26	182.1	39	163.3	52	149.0

EXAMPLE:

Bituminous Coal.

Moisture	10.00 per cent.	— M	m — 16.00	B.T.U.'s per pound of dry substance — 12,802.
Volatile matter	39.50 "	— V	v — 162.75	
Fixed carbon	40.50 "	— C	c — 140	
Ash	10.00 "	— A	a — 30.00	
	100.00			
Sulphur	3.00 "	— S	s — 39.00	

(*Continued from page* 215)

"The Voucher System."
"Co operation and Progression."
"Collections."
"Balancing Consumers' Ledgers."
"Meter Reading."
"Handling the Public."
"Complaints, Etc."

These meetings were well attended and the employees benefited by them. At intervals, general meetings of all the employees in the organization were held. These meetings were addressed by the Vice-President, or someone selected by him, and were held with the idea of acquainting the employee with his co-workers and bringing about co-operation among the various departments. They were informal and a collation was usually served. We shall continue these educational talks during the winter of 1912-1913, but as yet no definite plan has been outlined.

SOME VIEWS OF A PICNIC.—"D.," writing from Baltimore, Md., under recent date, forwards the following: With their wives, children and friends, the employees of the gas division of the Consolidated Gas, Electric Light and Power Company, of Baltimore, enjoyed an old fashioned family picnic at Tolchester Beach, Chesapeake Bay, on Labor Day. The Company leased the grounds for the day, chartered two steamers, providing a willing set of musicians, and prizes for the athletic events. More than 3,000 people made the trip. The

purpose of the management in providing the outing was simply to bring the members of this large organization, which serves the people of Baltimore with light, heat and power, into closer contact, and to afford an opportunity for social intercourse among their families. There was no discussion of business. The day was given over to pleasure. Amongst those who enjoyed the outing were a number of the veterans of the service who had been retired on annuities. Some

of these men had devoted a half century of their lives to the service of the public; a much longer time than is shown in the average life of men. There was a fine programme of athletic events, including a number of obstacle races. The winner of the highest number of points was Eugene D. Milener. On the return trip the prizes were awarded by Mr. Charles M. Cohn, Vice-President of the Company. There were gold, silver and bronze medals for the winners of the various contests, and a silver pin for the ladies' race. The arrangements for the outing were made and conducted by the following committees:

Executive Committee.—Messrs. H. K. Dodson (Chairman), G. R. Althen, W. H. Cassell, George Beadenkopf and Wm. Schmidt, Jr.

Entertainment Committee.—Charles M. Cohn (Chairman), and Messrs. Wm. Schmidt, Jr, Geo. Beadenkepf, R. S. Scott, G. R. Althen, J. C. Metcalf, H. K. Dodson, A. W. Hawks, Jr., A. F. Krug, W. H. Cassell, H. B. Lohmeyer, D. C. Bruce, W. T. Connor, J. W. Hoover, George Riehl, C. E. Wollman, B, A. Duvall, L. B. Wilson, Jr., E. M. Sturtevant.

Field Committee.—H. B. Lohmeyer (Chairman), and Messrs. C. E. Wollman, H. S. Barrett, D. C. Bruce.

Publicity Committee.—A. W. Hawks, Jr. (Chairman), and J. W. Hoover.

CHANGES IN THE MUELLER MFG. COMPANY'S ROUTINE.—Among the many important changes and extensions that are being made in the business of the H. Mueller Mfg. Company, of Decatur, Ills., and New York City, is the establishment of a Pacific Coast Branch, at 589 Mission street, San Francisco, Cal., where it is organizing an office with additional sales force and completing arrangements for the installation of a large stock to be ready to turn over to the Coast trade to this new branch within the next 60 days. Mr. "Tom." F. Leary will be in charge as general manager.

This branch is the natural sequence of the great development of the Mueller Company's business in the far West. The popularity and sale of Mueller goods have reached such proportions in that section that the Company has found it difficult to handle the same from the factory in the middle-West as promptly as it desired to do. The determination was, therefore, reached some months ago to establish a western branch, and San Francisco was chosen as the most effective point from which to operate. The plans formulated in the spring culminated in the selection of quarters in the handsome building, 589 Mission street. The Mueller Company will occupy the first floor and basement, carrying a complete stock of plumbing, water, and gas goods so that shipments in the western territory can be made promptly.

The announcement of the selection of Mr. "Tom." F. Leary as General Manager of the Mueller Pacific Coast branch will be pleasant news to his legion of friends, who will rejoice with him over his advancement. The one regret they will feel will be the fact that his promotion carries him away from them to a new field of labor. "Tom." Leary is one of the finest examples of a brass goods' salesman in the country. He has been a part and parcel of the plumbing brass goods industry from his youth until the present, and knows its ins-and-outs from beginning to end. He knows the manufacturer's and plumber's side, respectively, and he knows the just and equitable dividing line between buyer and seller. His fairness, honesty and courtesy will make him as popular west as east, and he will prove a

valuable representative in upholding the business policy of the Mueller Company. Mr. Leary will have for his aids in the branch, men who, having been identified with the Company, are familiar with the Mueller product and the Mueller policies. An organization will be perfected which will prove efficient and effective. The opening of the Pacific Coast branch brings about a number of other changes in the Mueller travelling sales force.

Mr. W. L. Jett, formerly in the shipping department, Decatur and Chicago branch, and later the Illinois salesman, goes to California. He will travel for the Pacific Coast branch with headquarters at Los Angeles. He will be succeeded in Illinois by Mr. C. H. DuBois, who recently joined the Mueller forces.

"Ed." Pedlow, an experienced brass goods salesmen, widely known to the Michigan and Wisconsin trade, succeeds to "Tom." Leary's territory, travelling out of St. Louis, Mo.

The establishment of the Pacific Coast branch will prove of enormous benefit to Mueller friends and patrons on the Coast, giving them opportunity to fill their wants in this high grade line on short notice, and is only another instance of the desire of the Company to give the quickest and best possible service to its patrons. It is also an evidence of the growing importance of this hustling Company in the brass goods field. The parent plant at Decatur, Ills., is now represented by an Eastern Division at New York City, a branch at 179 N. Dearborn street, Chicago, the Pacific Coast Branch at 589 Mission street, San Francisco, and, within the next few months, by the factory now building at Sarnia, Ontario.

Special English Correspondence.

COMMUNICATED BY NORTON H. HUMPHRYS.

SALISBURY, ENGLAND, September 10, 1912.

Some Unexpected Blessings.—The Lady Inspector.—Floods of Gas Supply.—A Wise Counsel.

Last month I commented on the worries attendant upon disputes in the coal trade, but these have not proved unmixed evils. It is very evident, from the reports of the half year working that have been appearing in our special trade serials over the last few weeks, that compensations have not been wanting. Let us hope they will prove to be of a more permanent character than the circumstances to which their origin is due. I refer in the first place to the very decided impetus that has been given to the use of gas, especially for fuel purposes. Some trade disputes have the sympathy of the public, but apart from the general impression that the miner is already sufficiently paid for his admittedly hazardous work, an impression that was supported by the extravagant character of the recreations indulged in during the time of idleness, the delay in starting after it was evident that a settlement was in sight, quite alienated the public sympathy that is one of the strongest supporters of a trade dispute, with the result that many people tried gas or petroleum simply as a substitute for or as a means of avoiding the use of coal. There is no doubt but that the fact that these substitutes were available, served to remove any serious privation as far as domestic consumption is concerned. At the same time it showed that the British public can manage to rub along without supplies of coal very comfortably, for a much longer time than was previously supposed, and that, whatever may be the case as regards certain manufacturing processes and railway traffic, it is not an indispensable commodity to the average household. It might well be expected that the householder would resort as far as possible to substitutes for coal, at a time when that mineral was listed at 40s. to 50s. per ton. And gas undertakings were not anxious to increase sales in view of a rapidly shrinking coal heap, and uncertainty as to when replenishments would be available. But it is also easy to understand that, having once experienced the cleanliness, reliability, and saving of labor brought about by the use of gas, there is no disposition to go back to the former more troublesome methods, and that no inconsiderable proportion of the increase may be regarded as of a permanent character. The demand for cookers that commenced in the spring has continued well on up to the present time.

But dear coal is not entitled to all the credit for this increase. Something must be said for the efforts that have been put forward by sellers of gas in the way of educating the consumer. The lady inspector of cooking stoves is now abroad. The Gas Light and Coke Company, of London, I am told, have a bevy of 24, exclusively engaged in visiting customers at their homes, and most of the larger companies have permanent lady officials on their staff, while it is becoming very usual, in the case of concerns too small to run a permanent inspector, to engage the services of a qualified lady for a period sufficient to admit a house to-house visit from one end of the district to the other. These efforts, it should be understood, are not on the lines of getting new business, but are directed towards the consolidation of that already secured. The lady need not of necessity be a full blown platform demonstrator, especially where a working class population have to be dealt with, but she should hold diplomas from schools of cookery, or other satisfactory evidence of proper qualification, as she will occasionally be asked to control cooking operations that happen to be in hand at the time of the visit, or to give an informal demonstration to half a dozen neighbors. Or she may be requested to give a short address to classes of cookery or domestic institutions. But the main object to which her attention is directed is to insure that the apparatus out on hire is regularly used. It is surprising how many cookers are found to be out of order; perhaps some little defect that prevents the oven or one of the large boiling burners from being used. Although it is only a matter of sending to the gas office, people neglect to do so for one reason or another. They do not like to complain, or they are waiting, and have been waiting, for the last 3 months, in the expectation of meeting one of the company's men in the street. Then the lady inspector finds out the deadheads, who merely regard the cooker as a makeshift or stand by. If the apparatus is supplied gratis, or at a normal rent, there are always some who think they "might as well" have it, although they do not require and do not intend to use it more or oftener than once in a way. She also finds a number of people who require information respecting little details that are not covered by the direction card. A good plan is to circularize the districts to be visited a week or 10 days in advance, and to furnish the lady with introduction cards from a head official at the gas office, and also a book in which the addresses of customers are entered in consecutive order, one road or street after its neighbors, on the left hand pages only, the right hand page being left blank for memoranda. By the use of code letters all the necessary information can be collected on one line, and the book when completed is a most valuable record for future use in the office. The exact code can be adapted to each district, but as an example I may mention D for "cooker in dirty condition;" I for "intermittent or irregular use;" N for "not properly ventilated;" S for "satisfactory supply of gas," etc. The lady must also carry a supply of complaint strips, on which particulars of repairs, alterations, etc., are entered and handed in at the proper quarters each day. The usual experience is that the increased use of gas during the following 6 months is more than sufficient to cover the expenses, which need not be great, and that the customers appreciate the visit as a personal attention. Also, as an incidental result, several who have been sitting on the fence for some time, thinking of having a cooker, decide to take the final plunge, and the regular canvasser, if such is employed, will recognize several troublesome prospects amongst the newcomers, people who have heard all he had to say and are impressed by it, but yet held off on one excuse or another.

Amongst other causes that have contributed to increased use of gas may be mentioned the 40-candle power per cubic foot reflex burner, which has been very extensively adopted. High pressure lighting is very effective, but is coming down to the level of electric light in that it is dependent upon machinery for efficient maintenance. But the ordinary pressure burner carries the special advantage due to gas, of having a reservoir containing a 12 hours supply behind it. The extensive improvements in gas fires and water heating apparatus should also be mentioned.

Another saving clause has been the increased price of residuals, some of which may be ascribed to the strike, and some to other causes. In the first class may be named the price of coke. As with gas, many who had not tried coke before were led to use it as a temporary substitute, with the result that for particular purposes it has retained a permanent footing. There has been no cheap coke this summer, and at the present time stocks are much lower than is usual at this season of the year. Tar and sulphate come under the second heading. Large quantities of tar have been used for spraying our principal highways throughout the country, as a means of minimizing the clouds of dust caused by motors. The degree of success already attained, and the increasing popularity of motor cars, go to warrant the expectation that this will prove a permanent outlet for a large quantity of tar. Crude tar is not satisfactory for this purpose. It must first be boiled for a sufficient time to dispel all ammonia or other matter soluble in water, light naphtha, or anything that boils below

250° F. There has been some prejudice caused by alleged poisonous effects of the rain washing of tar sprayed roads on adjacent streams, as affecting the health of the fish, but any trouble in that direction can be entirely allocated by intelligent preparation and work. The tar must be properly refined and the road at the time of the operation must be perfectly dry and not too cold. The increased demand for sulphate of ammonia has been largely due to the labors of the Sulphate of Ammonia Committee.

We have experienced an unusually wet August which is a very great inconvenience at a time of year when we expect climatic conditions to be favorable to outside work. Operations such as the painting of gasholders, or extensions of mains in the public roads, have been sadly hindered. But in one or two instances the inconvenience has been of a much more trying character. All the low lying parts of the city of Norwich were flooded to such an extent that thousands of people had to leave their homes, and the consequent privation and distress are so serious that a public appeal for subscriptions has been made. The electric light works were completely out of action for some days. The gas works suffered less severely, and managed to keep going, but were inundated to the extent of nearly 2 feet deep. The steam boilers and the water gas plant had to be shut down, and the pits of the coal elevators were flooded, rendering it impossible to convey the coal. But it was found possible to run the exhausters, also the retort house machinery, which was driven by a gas engine, and to keep down the water in the generator pits, so the manufacture of coal gas was maintained. There was no curtailment in the supply of the public lamps or of the private consumers. At Leicester, the roads in the vicinity of the gas works were flooded, in the course of a few minutes, to the extent of nearly 18 inches, by the overflowing of a river. But the rising of the water had not escaped attention at the gas works, and dams were constructed of double rows of boards weighted down with sacks filled with oxide of iron from the revivifying sheds, the intervening space between the boards being made up with well rammed clay puddle. All entrance doors to cottages or other means of indirect access to the works were also made sound in a similar manner. The openings to the retort house cellars were protected and all manholes to liquor or other below ground tanks were made bottle tight with puddle. As a result there was no interference whatever with the regular operations. The flooding of gas works in the autuum or early spring is not an unheard of occurrence, but such a happening during the height of the summer is quite unprecedented.

A somewhat novel, but by no means unimportant consideration in connection with public lighting has been under the view of the Municipal Authorities at Newmarket. The usual practice, where both gas and electric supplies are available, is to pit one against the other for all they are worth, without regard to other possible consequences. But the Newmarket Councillors must be credited with unusual foresight. At present the district is lighted by the gas company, and in inviting tenders both for gas and electricity, the gas company have been requested to state whether, in the event of their losing the public lighting, any increased charge would be necessary in the case of private consumers, while the electric company are asked to say if the securing of the contract would enable them to offer any reduction or concession to the private user. The electric people pointed out that the profits on the lighting contract would be small, and would not warrant an immediate reduction to the ordinary consumer. The gas company were more explicit, and said that the public lamps took one-twelfth of the total output and that the loss of the public light would mean more than one-twelfth of the net profits, and would necessitate an increase in the ordinary selling rate of 3½d. per 1,000 cubic feet. It is a pity that considerations of this sort are not more general. In small districts of 10,000 inhabitants or less there is not room for two distinct and separate light supplies, if the best and most economic conditions for the consumer are to obtain, nor are the competing undertakings going to continue to cut each other's throats for the benefit of the public for any length of time.

"M. T. W.," writing from Philadelphia under date of the 24th inst., informs us that Mr. William Maloney, Superintendent of the Pennsylvania Globe Gas Light Company (he was a brother of Mr. Martin Maloney, of Philadelphia) died in St. Joseph's Hospital, Philadelphia, some days ago. He succumbed to a complication of ills that followed a stroke of appoplexy which beset him at his home in Ocean City, N. J., some weeks ago.

Correspondence.

[The JOURNAL is not responsible for the opinions expressed by correspondents.]

Further Chapters in the Lamp Controversy by Mr. Conroy.

GENERAL GAS LIGHT COMPANY,
NEW YORK, Sept. 18, 1912.

To the Editors, AMERICAN GAS LIGHT JOURNAL: Replying to a letter, published in the JOURNAL for August 19th, written by Mr. Pierce, Illuminating Engineer of the Welsbach Company, in which he states are several grave errors in my comparison of different light units, as per the communication in the JOURNAL dated July 29th. After reading Mr. Pierce's letter carefully it would seem to me the grave errors which he seems to think I have committed, and even as bad as he would make them, are excelled in that direction by his own letter, save I regard them not so much as errors as an attempt on his part to avoid the issue and mislead the reader.

If Mr. Pierce will kindly refer to my communication he will readily see my comparison was made on the total light production from each lighting unit, and I safeguarded my meaning by giving the total lumens of each light source in question. Furthermore, I took for my basis the test (as published) as coming from the Welsbach Testing Laboratories on both the inverted arc lamp and the reflexolier, so if this is in error it would seem the gravest error which I have committed is the assumption that tests coming from this source are reliable, consistent and worthy of comparison.

He further criticises my comparison of tests on reflexoliers, fitted with clear chimneys and prismatic reflectors as against an inverted arc lamp fitted with a clear glass globe, stating that thls combination is almost never permissible in actual practise. For his information as well as that of your readers, I would advise I have taken from our books a record for the past month of all inverted gas arc lamps shipped out with their equipment, which shows that 46 per cent. of all lamps thus shipped were ordered to be, and were equipped and shipped, with clear glass globes. If such a combination is not permissible in actual practice, why the necessity of the Welsbach Company publishing a light curve of its arc lamp thus equipped?

What I would further like to have Mr. Pierce do is to refer to "Progressive Age," dated April 15th, 1912, page No. 281, wherein is illustrated a banquet held at the Welsbach Company's factory, Gloucester, N. J., the night of March 15th, 1912, directly above the banquet table being shown an inverted arc lamp equipped with a clear glass globe. I understand that this banquet was given to a body of men representing the largest syndicate of gas companies in this country; and, such being the case, it would seem that if a permissible equipment of lighting fixture was ever to be used it would be before such a body and on such an occasion. Also, at the recent gas exhibition at Toronto, Canada, I noticed nearly all the Welsbach gas arc lamps displayed in its booth were fitted with clear globes.

Mr. Pierce in his letter further presumes to dictate to us how fixtures should be equipped for such a comparison as we would make, and specifies that the reflexolier should be fitted with clear *cylinders only*. Then, immediately following this, he gives a table of tests which he has conducted, evidently with intent to disprove our statements; but in this test, thus conducted, he fails to live up to the rules of test already laid down by him. He shows in his tests an arc lamp fitted with an opalescent globe and single burners with prismatic reflectors, but fails to state the kind of chimneys used, presumedly clear glass.

For my part I cannot understand why it is not as permissible to use a clear glass globe on an inverted arc lamp as it is on a cluster of inverted single burners. Possibly Mr. Pierce will undertake to tell us the glare is so great from an arc lamp that it is injurious to the eye. If the actual candle power developed by the arc lamp is no greater than the cluster of single burners, I cannot perceive why the glare should be any greater on the eye, or even as great, when the reflexoliers are fitted with prismatic reflectors to reflect all of the light downward into one's eyes.

I leave it to the readers to decide if the comparison drawn up by Mr. Pierce is a fair one; but even with the handicap he has put on the inverted arc lamp, by fitting it with an opaline globe, that according to our test absorbs about 30 per cent. of the light, he still concedes 10 per cent. higher efficiency for the arc lamp over the total light output.

While, according to my comparison, I claimed 59 per cent., making an allowance for absorption of light by the opaline globe, it

would seem that our figures compare very closely and, therefore, his tests prove my contention.

In my opinion the distribution of light does not enter into the question in any way, for the reason that light rays can be reflected in almost any direction desired by the use of reflectors; but, inasmuch as he sees fit to raise the question, it only affords us an opportunity to further prove our contention.

Mr. Pierce refers to the working plane, but fails to advise us what he regards as such. In our opinion the working plane is wherever the most light is desired. For instance, the working plane of an automobile light would be directly ahead, and the working plane of the foot-lights of the stage would be about 120°, while in store lighting the working plane is not only from the height of the counter up to the height of an ordinary man's head, but it is on the side walls, shelves or anywhere else in the whole space where goods are kept or displayed, or where one has access to be employed, and thus the reason why the gas arc lamp seems to be the gas lighting fixture most adopted for general store and large area lighting.

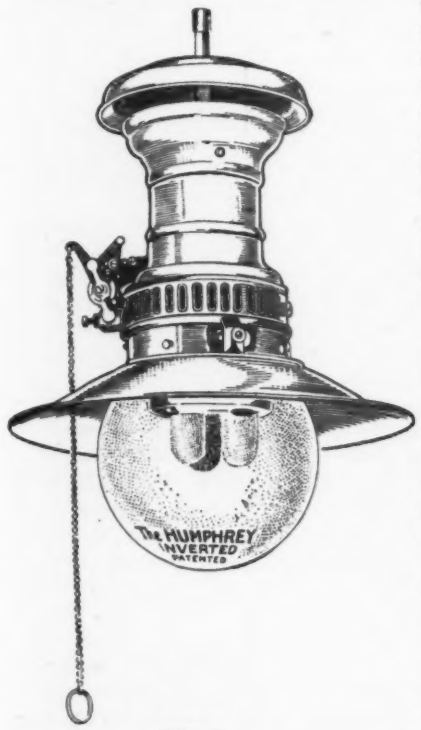

Fig. 1.

In order to be entirely fair with Mr. Pierce, let us accept his newly invented comparison; that is, the amount of useful light per cubic foot of gas, the light which actually reaches the working plane. As stated before, Mr. Pierce fails to advise us what he regards as the working plane, but presumedly it is in the 60° zone.

Referring to the best tests which we have received of the reflexolier (if it is a 3-light reflexolier) these are as follows:

Consumption of gas, 9.55; total lumens, 1,519; total lumens for 60° zone, 1,159; lumens per cubic foot M. S., 150; lumens per cubic foot, 60° zone, 121. We judge, from the reading of Mr. Pierce's letter, he was wholly ignorant of the fact, or else he wished to leave the reader to believe it is impossible to use a reflector on a gas arc lamp, therefore, is shown in Fig. 1, a Humphrey 3 burner, No. 30, factory-lamp with a porcelain reflector. This is a regular standard lamp which we have been furnishing the trade for some time.

In Fig. 2 is illustrated a light curve of this lamp, as tested at the Electrical Testing Laboratories, August 6th, 1912, which shows: Consumption of gas, 11.25 feet; total lumens, 3,113; total lumens in 60° zone, 1,652; lumens per cubic foot, M. S., 267; and lumens per cubic foot, 60° zone, 146. It will he seen by this that a Humphrey No. 30 factory lamp, fitted with reflector on a total means spherical, shows 117 lumens per cubic foot of gas consumed more than the 3-light reflexolier, and 25 lumens per cubic foot of gas consumed more than reflexolier in a 60° zone. or the useful light per cubic foot of gas, or the light which actually reaches the working plane.

We are aware that Mr. Pierce may take serious objection to this comparison, for the reason that, for want of the tests of the Welsbach arc lamps equipped with a reflector, we have been compelled to use the test of a Humphrey which was taken at a different time and plane than that of the reflexolier; but if Mr. Pierce would live up to the specification laid down by himself in a comparative test, fitting an Intenso arc with a clear glass globe, and a glass or porcelain reflector, and reflexoliers with clear chimneys and prismatic reflectors, if he so desired, making the test according to his own idea of comparison, we believe, the results would compare well with our figures above given.

As far as the light curve furnished by Mr. Norman Macbeth in his paper on "Competitive Illuminants," read before the Minnesota Electric Association, is concerned, I cannot see how those curves play any part in the question involved. It is true one can get almost any results desired less than the maximum, if one starts out to do so and, like expert testimony that the expert employed to give the testimony,

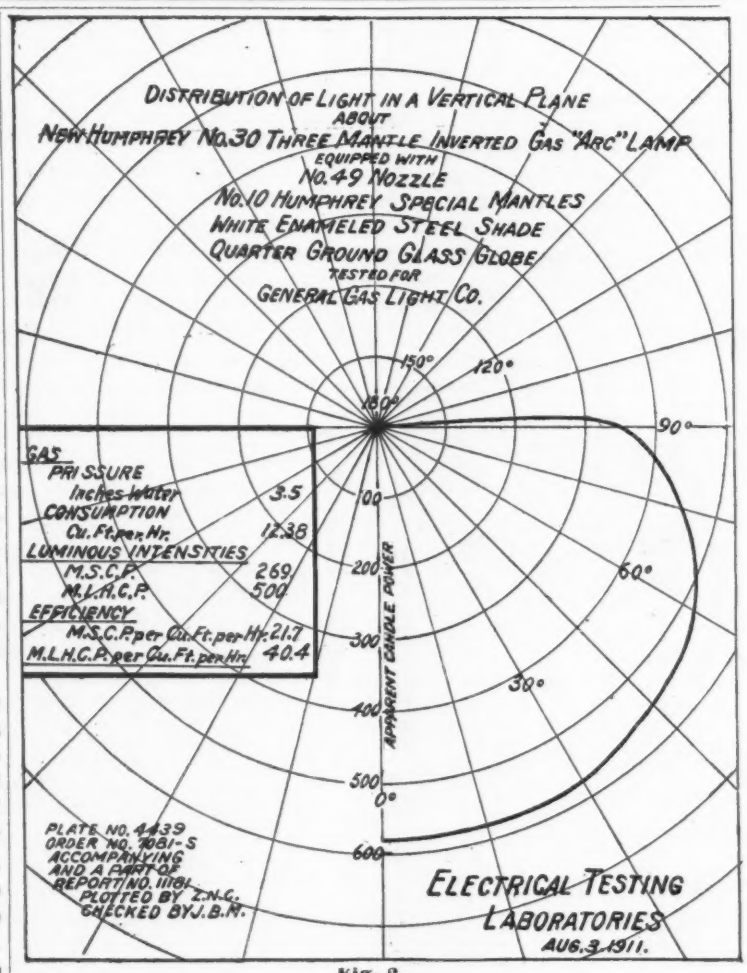

Fig. 2.

as is generally understood in advance, the testimony will be favorable to the one employing him before testimony is given.

I also note he states in the article that these tests were made with careful adjustment, maximum candle power and by skilled photometrist. Unfortunately, it is not given that skilled photometrists are always, or in fact often, experts on adjusting different kinds of lamps to get the highest efficiency therefrom; but there is nothing in this test to show that any reasonable amount, in consistency, was used in getting those results such as the quality of mantle, etc.

In all of the tests published (one which is represented by curve "A") only the best grade of Humphrey mantles was used, and, beyond a doubt, under the same conditions, we could have secured a test like unto curve "D," by using an inferior make of mantle. As to Mr. Pierce's criticism of a certain gas company advertising light curve "A," and delivering in actual practice light curve "D," that proved nothing against the gas arc lamp, and it is barely possible that it was not so much the fault of gas or pressure as it was the use of an inferior grade of mantles. Furthermore, as Mr. Pierce seems to be so exact in his comparison, in stating that the test should have been conducted under identical conditions, even to the same moment, if one is to be as exact as he would lay it down to us then were the same gas company to make a test and produce a light curve of the lamp to-day it would scarcely be permissible to use it in an advertisement of to-morrow.

Furthermore, whatever the results were obtained by Mr. Macbeth with this lamp, it is fair to assume that reflexoliers would have suffered as proportionately a decrease in candle power under the same conditions, so I cannot see how this strengthens his original contention in any way.

Mr. Pierce would lead us to believe that the useful light is that which actually reaches the working plane. In order to show what a serious error this is, and how deception might be and ofttimes is practiced: In Fig. 3 we illustrate a 3 burner, Humphrey inverted, arc lamp, fitted with a mirror reflector 16 inches diameter and 4½ inches deep. In some cases for window lighting this lamp and equipment have been used. In Fig. 4 we illustrate a light curve of this lamp, as tested at the Electrical Testing Laboratories, August 3d, 1911. The test shows 32 tenths pressure; consumption of gas per hour, 11.53; C. P., maximum, 2,900.

In the first place it would be wholly unfair for us to claim 2,900-candle power for this lamp; and, in the second place, while it showed

2,325 lumens on the 60° zone or working plane, or 201 lumens per candle-foot of gas in the working plane, it would be unfair to claim this a more efficient lighting fixture in the lighting zone than the light curve illustrated in Fig. 2, which shows only 146 lumens in the 60° zone per cubic foot of gas, and the reason why it is not as efficient a lighting fixture is that all the light is concentrated in too narrow a zone for any ordinary lighting, the greater part of the light being reflected on the floor and absorbed therein. But what is true of this light curve is true to a certain extent of the reflexolier, because its maximum candle power being shown to be directly downward, is, therefore, absorbed on the floor, wherefore the reflexoliers are not the most efficient distributors of light, even in the 60° zone. It is very evident, in the reading of the last paragraph of Mr. Pierce's letter, that he would lead all to believe that reflectors cannot be used on inverted arc lamps, hence one of our reasons for illustrating Figs. 1 and 3. The reflector has been purposely omitted from the Humphrey inverted arc in the majority of cases, for the reason

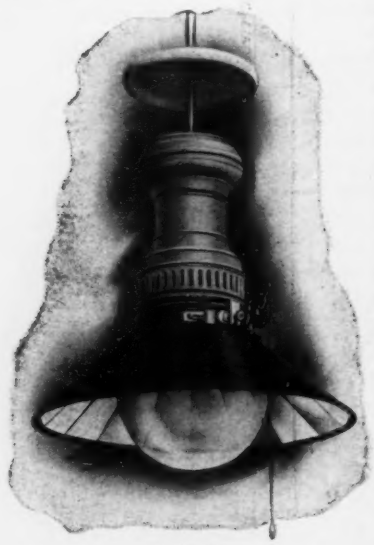

Fig. 3.

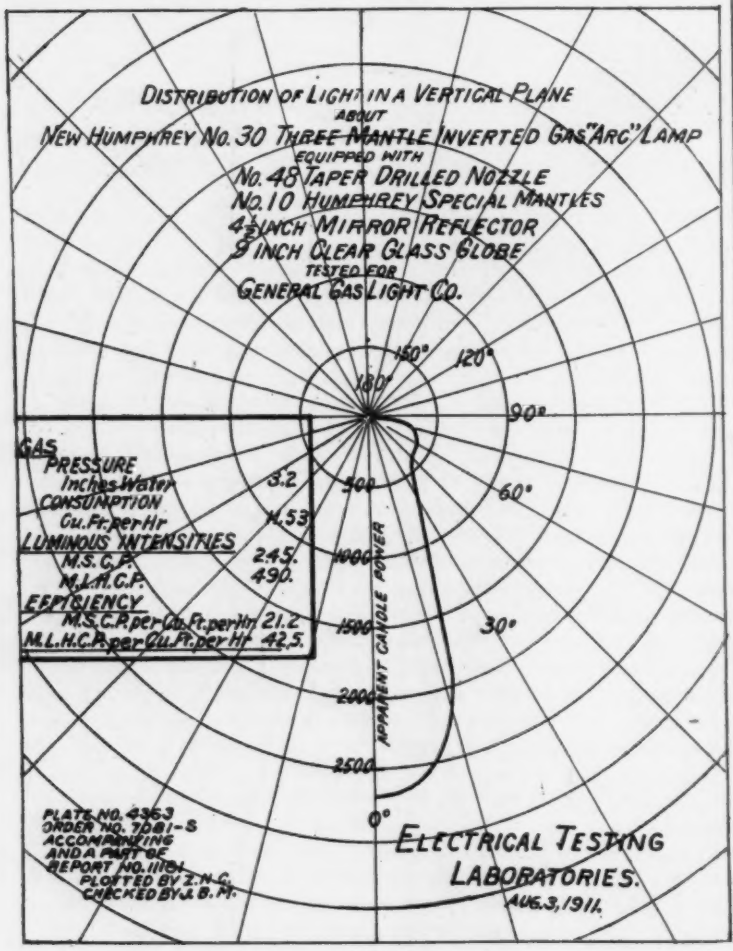

Fig. 4.

that we have found the light distributed therefrom without a reflector is the best for general illumination.

Just one statement made in Mr. Pierce's letter with which we are in accord, is that arc lamps are lower in maintenance expense than reflexoliers, and we are glad to get an admission of the fact from such source. Referring to our remarks, as to the relative efficiency of tungstens over the carbon filament lamps, we think he wholly forgot to take into consideration the cost of renewals on tungsten lamps.

In conclusion let me say, were I not personally acquainted with the gentleman and his connection, I would be sure, through reading his letter, that he was connected with some electric lighting interest that sought to discredit gas lighting; and why he refuses to take or claim the credit due gas arc lamps for increased efficiency, in view of the fact that his company deals in this kind of lamp, is more than the writer is able to understand, unless it be that, from its standpoint, gas arc lamps are not a success; therefore, he seeks to discredit same.

Very truly yours,
J. P. CONROY,
Manager, General Gas Light Company.

Items of Interest
FROM VARIOUS LOCALITIES.

THE State Board of Gas and Electric Light Commissioners are considering (as directed) the following instruction adopted by the Massachusetts Legislature at its last session: "That the Board of Gas and Electric Light Commissioners be directed to revise, consolidate and arrange the general laws of the Commonwealth pertaining to the manufacture, transmission, distribution and sale of gas and electricity, and to corporations engaged therein, not including street railway, telegraph or telephone companies, and in connection therewith to consider the expediency of additional legislation affecting the relations of such corporations to the public and to one another, and of extending the existing provisions of law for supervision and regulation to any or all of them." The first hearing was had on the 19th September, and it was naturally in the form of a preliminary, at which the present laws, as to their sufficiency, were considered. Prominent amongst those present were: Mr. A. M. Barnes, Cambridge Gas Company; Mr. J. A. Coffin, of Gloucester; Mr. H. S. Harriman, of the Connecticut River Transmission Company; and Mr. W. R. Peabody, representing several electric light companies in the western part of the State. The hearing was adjourned to the 21st prox.

MR. EDWARD WARE, one of the prominent residents of Waterville, Me., and prominently identified with the fortunes of the Waterville Gas Company, in the time between 1893 and 1901, died at his home in Waterville, the morning of the 13th inst. Deceased was born in Athens, Me., May 14, 1854, and removed to Waterville in 1872, there to take a position in the Merchants' National Bank, which financial institution had been founded by his father, the late John Ware. His immediate survivors are his widow and 3 sons.

EDWARD MASON, bookkeeper for the Webster City (Ia.) Gas Company, has mysteriously disappeared. His flight could not have been occasioned by any financial irregularity, for his accounts were only $14 short, a sum that likely he could explain away in a second. He was a very popular man in his community.

MR. IVOR THOMAS, of the Kansas Gas and Electric Company, has been elected Secretary of the Riverside Club, of Wichita, Kas., vice Mr. C. Halton, resigned.

THE properties of the Emporia (Kas.) Electric and Gas Light Company have been purchased by Messrs. Howe, Corrigan & Co., of Grand Rapids, Mich., and the corporate title has been changed to that of the Emporia Gas Company. The plant will be to all intent rebuilt, the contract for the apparatus having been awarded to the Kerr Murray Company, of Fort Wayne. Mr. D. V. Dickey will remain in charge.

MR. D. H. SHOEMAKER is no longer in the service of the Chambersburg (Pa.) Gas Company, having given up his position therein to take service with the Atlantic Refining Company.

THE proprietors of the Green Bay (Wis.) Gas and Electric Company are proposing to furnish gas to the residents of De Pere, and their right to do so will be established at the October meeting of the City Council.

THE Danville (Ky.) Light, Power and Traction Company has been purchased, and hereafter will be operated by a syndicate, at the head of which is Mr. H. C. Wood.

MR. WALTER W. DEARTH has resigned as Manager of the Pana (Ills.) Gas and Electric Company, to accept a position with a manufacturing concern in Muncie, Ind. His successor is Mr. H. I. Nutt, of Taylorville, Ills.

THE Omaha (Neb.) Gas Company has agreed to distribute gas to the residents of the outlying district of Benson for a term of 25 years. Under the agreement the Company may charge $1.30 per 1,000 cubic feet for the first 10 years, with a minimum charge of 50 cents per month. After the initial 10 years, the rate shall be that charged by the Company in Omaha city.

THE increase in sendout by a certain Eastern Company, first 7 months of 1912, exceeded that for the like period of 1911 by 29.76 per cent. The volume gain was 30,920,200 cubic feet. All of which looks pretty well for an industry which is said by some to be in declining way.

THE official tests of the gas plant erected for the authorities of Albany, Ga., by Mr. A. M. Sutherland, having proved altogether satisfactory to the board of examiners, the plant was accepted by the city. Instead of board of examiners we should have written the Water and Light Commission.

"A. S. B. L.," writing from Nashville, Tenn., under date of the 23d, inst., reports that every time he goes away on a trip, orders for the Consolidated Company's oxide begin to crowd in. He is seriously thinking of suggesting to the Company, that it purchases one of the Thousand Islands, to enable him to live there, insuring an enormous volume of business for the Company. An interesting thing about the orders is that many of them are repeat, showing that Consolidated oxide is giving satisfaction wherever it is used. Recent orders include one for 260 tons from Bridgeport, Conn.; another directs the shipment to Monterey, Mexico, of several carloads.

MR. THOMAS B. BEEBE, as Western Sales' Manager for Messrs. Rathbone, Sard & Co., with headquarters in Aurora, Ills., was formerly Superintendent of the selling staff of the Peoples Gas Light and Coke Company, when that cleverest of commercial men (Mr. Jno. C. D. Clark) was the Commercial Agent of the Peoples concern.

"H. L. L.," writing from Hagerstown, Md., under recent date, informs us that early this month a meeting of the employees of the Hagerstown Light and Heat Company was held, the call having been issued at the instance of the General Manager, Mr. M. M. Milton. Fifteen white men, and one "colored person," familiarly known as "Uncle Ben," reported to the call. Mr. Milton, in brief speech, explained that call was made through the impelling idea that both the interests of the men and those of the corporation would be better served were they to form an Employees' Association. Light refreshments having been served, those present were called formally to order for the transaction of the business in hand. Mr. A. H. Campbell was selected as temporary chairman, and a committee to nominate officers was thereupon named (Messrs. Lane, Richer and Hamby), with instructions to report as speedily as possible. The result of their labors was the naming of these officers: President, A. H. Campbell; Secretary, H. S. Suavely. In the absence of the last named, Mr. Lane was appointed Secretary *pro tem.* Messrs. H. D. Walbridge, F. T. Hepburn, H. S. Brown and F. E. Haag were elected honorary members. Messrs. Milton (Chairman), Hamby, Hensell, Munson and Lane were appointed a committee to frame a constitution and by laws, and then the President called for discussion on current topics. Mr. Milton read from the AMERICAN GAS LIGHT JOURNAL an article on "Methods of Increasing Efficiency of Employees," by Mr. J. A. Perry, of Omaha, Neb., which was acknowledged an interesting handling of an interesting theme. The main discussion of the evening had to do with a recent decision of the Company's management to give employees credit for sales of lamps, appliances and the gaining of new business. This discussion was quite brisk, and it was terminated by the adoption of a resolution to appoint a committee of three, representing respectively the accounting, new business and distribution departments, the committee to be instructed to present to the Association a list of rules to govern the apportionment of credits. This committee subsequently reported a set of rules, which were ratified. The next meeting will be held to-morrow evening.

MR. ROBT. H. LAWLER, since 1908 General Superintendent of the Wilmington (Del.) Gas Light Company, resigned that post early this month, to accept a responsible position with a Company in Indiana, the name of which is unknown to us. The Friday prior to his departure the employees of the Company presented him with a valuable gold timepiece. The spokesman assured Mr. Lawler that they fully appreciated the way in which they were supervised by him, and assured him that he would be much missed by them. The recipient was considerably stumped at this unexpected action of his men, but in acknowledging their remembrance he made it plain to them as it was with the men so it was with the master.

"B.," WRITING from Detroit, Mich., under date of the 24th inst. says: "I'm just back from a short trip through the near-Northwest territory, which took me into Beloit, Wis., and I'm sure I was far from being prepared for that which I saw. I knew last spring that the Beloit Water, Gas and Electric Company was preparing to occupy new office quarters, but I was not at all of the mind that the corporation's present headquarters were to be like unto that which they are. Located, as they are, in the business heart of the city, in the new Ackley block on East Grand avenue, the change from the old home will be certainly appreciated by both office staff and customers. I will not attempt to describe the arrangement of the housing, save to say that it is practical, commodious and well arranged, and that harmony in design only adds to the general effectiveness of the premises as the busy headquarters of a growing corporation. Perhaps General Manager B. F. Lyons could be induced to give you an illustrated description of the place."

Well, if he will accept the task the invitation to furnish our readers with such description is extended to Mr. Lyons.

THE Standard Light and Power Company, of Fostoria, O., has assigned its plant and franchises to Mr. Field W. Sweezer, of New York, as Trustee of the American Gas and Electric Company, at a figure equivalent to $82,500.

THE Freese Construction Company has turned over to, and it has been accepted by, the owners of the gas plant at Edwardsville, Mo. The test or tryout was satisfactory in every respect.

MR. FRANK PASSMORE has been appointed to a responsible position with the Winnipeg (B. C.) Company.

THE Penitentiary Board of Little Rock, Ark., has authorized the Pulaski Gas Company to install gas at the penitentiary for fuel use in the kitchens, laundries and workshops of that institution; also, for power purposes in connection with the operation of the State electric lighting plants.

"B. S. B." is informed that the home offices of the Northern Central Gas Company will be in Williamsport, Pa., and Mr. W. R. Rhoads will continue in charge as General Manager of the Williamsport plant.

THE United Railways and Light Company has announced that the bonds of its constituent La Porte (Ind.) Company will be redeemed at par and 5 per cent., the 1st prox.

DURING the past year the Gardner (Mass.) Gas, Fuel and Light Company increased its distribution system by the placing of 13,582 feet of main pipe. Considerably over half of this was from 4 to 6 inches diameter.

THE proprietors of the Massillon (O.) Electric and Gas Company have agreed to supply the local school board with gas and electric currents at 60 per cent. of the rates obtainable under their existing schedules.

WHAT do you think of this? The gas output of the Rochester (N.Y.) Railway and Light Company, during the 3 months of the past summer, averaged 450,000 cubic feet per day more than in the corresponding period of last year.

THE result of the hearing over the right of the Tucson (Ariz.) Gas and Electric Company to charge a minimum rate (the charge appealed from amounted to 50 cents per month) per month is a ruling for the defendants; the further finding in the case is that would-be consumers who have been obliged to make a deposit of $25 to guarantee their payments, will hereafter (in the case of business houses) be required to deposit $15; the deposit in the instance of residences was fixed at $20. The text of the order is:

1. That the meter rental heretofore made, charged and collected by defendant Company is hereby abolished.

2. That, until further order of the Commission, no readiness to serve or maintenance charge for electricity shall be made by the defendant Company to exceed $1.50 per month; and in no case shall said charge be made, except in case the electricity consumed in any one month, charged for at the regular rates shall be less than the sum of $1.50, and in such case no charge shall be made for the electricity consumed.

3. That, until the further order of the Commission, the defendant Company may, at its option, require a deposit for residential lighting not to exceed $5, for each residence, and for commercial lighting not to exceed $10 for each place of business, said deposit to be returned upon the termination of the service rendered to the consumer, and all deposits (except construction prepayment deposits) now in the hands of the defendant Company in excess of the amounts herein prescribed shall be refunded by the defendant Company within a period of 30 days from the date thereof.

THE Shore Gas Company, Belmar, N. J., has informed the Mayor of Manasquan, N. J., that it will no longer supply gas to the public lamps, until it is reimbursed by the authorities for the malicious destruction of its lamps operated on public lighting account. Lamps to the value of $120 were destroyed during August last. The Mayor declares the lamps are maintained by the Company, hence the repair should be done by the latter. The Company's reply is that the police protection is insufficient, wherefore the city should make good.

The Market for Gas Securities.

The market for city gas shares, especially in the instance of Consolidated, stiffened considerably since Friday last. The opening today (27th) was reported at: Bid, 147¼; asked, 147½, which represents a gain in the bid equal to 3¼ points for the 6 days. The "laying away" of the Manhattan Electric Company's ghost—we are not quite sure that is its proper name, for the enterprise has masqueraded under many titles—through the purchase of a goodly portion of a bond issue by parties not inimical to the interests of the Consolidated puts the quietus on the scheme. *Sic transit*, etc. The reinforcing, and correcting of inequalities in the Company's distribution system goes on with celerity. Its business in general constantly improves.

Brooklyn Union is inclined to drowsiness, quotations respecting same are maintained. Peoples, of Chicago, holds well to its recent advance, while Lacledes are rather on the weak side. American Light and Traction recently made a new high record, having sold at 430; and sales of American Gas and Electric were made at 96. Denver Gas and Electric 5's are 95 to 97, and Pacific Gas and Electric is firm at 65, or so.

Gas Stocks.

Quotations by George W. Close, Broker and Dealer in Gas Stocks.

115 BROADWAY, NEW YORK CITY.

SEPTEMBER 30.

☞ All communications will receive particular attention.

☞ The following quotations are based on the par value of $100 per share:

N. Y. City Companies.	*Capital.*	*Par.*	*Bid.*	*Asked*
Consolidated Gas Co.	$78,177,000	100	147¼	147½
Central Union Gas Co. — 1st 5's, due 1972, J. & J.	8,000,000	1,000	103	106
Equitable Gas Light Co.— Con. 5's, due 1932, M. & S.	1,000,000	1,000	105	106
Mutual Gas Co.	8,500,000	100	152	157
New Amsterdam Gas Co.— 1st Con. 5's, due 1948, J. & J.	11,000,000	1,000	101	102½
New York & Richmond Gas Co. (Staten Island)	1,500,000	100	35	50
1st Mtg. Gold Bds. 5 p. ct.	1,500,000	—	98½	100½
New York and East River— 1st 5's, due 1944, J. & J.	3,500,000	1,000	103	105
Con. 5's, due 1945, J. & J.	1,500,000	—	95	100
Northern Union— 1st 5's, due 1927, J. & J.	1,250,000	1,000	99½	101
Standard	5,000,000	100	61	70
Preferred	5,000,000	100	93	100
1st Mtg. 5's, due 1930, M. & N.	1,500,000	1,000	103	105
The Brooklyn Union	15,000,000	1,000	146½	147
1st Con. 5's, due 1948, M. & N.	15,000,000	—	105¾	107
Yonkers	299,650	500	120	—
Out-of-Town Companies.				
Bay State	50,000,000	50	⅜	½
" Income Bonds	2,000,000	1,000	—	75
Binghampton Gas Works	450,000	100	—	—
" 1st Mtg. 5's	509,000	1,000	97	100
Boston United Gas Co.— 1st Series S. F. Trust	7,000,000	1,000	82	85
2d " " "	3,000,000	1,000	47½	50
Buffalo City Gas Co.	5,500,000	100	5	8
Bonds, 5's	5,250,000	1,000	59	60
Capital, Sacramento	500,000	50	—	35
Bonds (6's)	150,000	1,000	—	—
Chicago Gas Co. Guaranteed Gold Bonds	7,660,000	1,000	104	106¼
Cincinnati Gas and Electric Co.	22,500,000	100	87	90
Columbus (O.) Gas Co., 1st Mortgage Bonds	1,500,000	1,000	96	98
Columbus (O.) Gas Lt. & Heating Co.	1,662,750	100	90½	91
Preferred	3,026,500	100	75½	80
Consumers, Toronto	2,000,000	50	200	204
Consolidated, Baltimore	13,460,084	—		—
Mortgages, 5's	2,400,000	—		—
General Mortgage 4½	10,661,000	—		—
Con. Gas Co., Baltimore City, 4½	2,751,000	—		—
Consolidated Gas Co. of N. J.	1,000,000	100	15	—
Con. Mtg. 5's	975,000	1,000	94	96
Bonds	75,000	—	—	100
Detroit City Gas Co.	6,580,000	—	—	50
Detroit Gas Co., 5's	881,000	1,000	75	80
" Prior Lien 5's	5,619,000	1,000	97	100½
Equitable Gas & Fuel Co., Chicago, Bonds	2,000,000	1,000	—	101
Essex and Hudson Gas Co.	6,500,000	—	132	136
Fort Wayne	2,000,000	—	—	—
" Bonds	2,000,000	—	55	—
Grand Rapids Gas Light Co., 1st Mtg. 5's	1,350,000	1,000	100	101
Hartford	750,000	25	190	200
Hudson County Gas Co., of New Jersey	10,500,000	—	130	138
" Bonds, 5's	10,500,000	—	104	106
Indianapolis	2,000,000	—	38	45
" Bonds, 5's	2,650,000	—	104½	105
Jackson Gas Co.	250,000	50	82	—
" 1st Mtg. 5's	290,000	1,000	91	95
Kansas City Gas Light Co., of Missouri	5,000,000	100	—	36
Bonds, 1st 5's	3,822,000	1,000	98½	99
Laclede Gas Co., St. Louis.	10,000,000	100	105½	106
Preferred	2,500,006	100	99	100
Bonds	10,000,000	1,000	102¾	103
Lafayette Gas Co., Ind.	1,000,000	100	—	60
Bonds	1,000,000	1,000	60	65
Louisville	2,370,000	50	120	120
Madison Gas and Electric Co. " 1st Mtg. 6's	400,000	1,000	106	
Massachusetts Gas Companies, of Boston	25,000,000	100	92½	93¼
Preferred	25,000,000	100	95½	96
Montreal Gas Co., Canada	2,000,000	100	233	236
Nashville Gas Light Co.	1,000,000	100	110	—
Newark, N. J., Con. Gas Co.	6,000,000	—	97	98
Bonds, 6's	6,000,000	—	127	128
New Haven Gas Co.	5,000,000	25	182	190
Peoples Gas Lt. & Coke Co., Chicago	25,000,000	100	116½	117
1st Mortgage	20,100,000	1,000	102	102½
2d "	2,500,000	1,000	104	—
Rochester Gas & Electric Co.	2,150,000	50	88	—
Preferred	2,150,000	50	118	—
Consolidated 5's	2,000,000	—	104¾	105¼
Pacific Gas and Electric Co.	15,500,000	—	63¾	64¼
St. Joseph Gas Co.— 1st Mtg. 5's	1,000,000	1,000	96	98
St. Paul Gas Light Co.	2,500,000	100	—	—
1st Mortgages, 6's	650,000	1,000	104	105
Extension, 6's	600,000	1,000	112¾	115
General Mortgage, 5's	3,447,000	1,000	94	96
Syracuse Gas Co., N. Y.	1,975,000	100	50	55
Bonds	2,047,000	1,000	101	103
Washington (D. C.) Gas Co.	1,600,000	200	420	425
1st Mortgage, 6's	600,000	—	—	—
Western Gas Co., Milwaukee	4,000,000	—	—	—
Wilmington (Del.) Gas Co.	600,000	50	—	—

MEETING TIMES OF THE VARIOUS GAS ASSOCIATIONS.

American Gas Institute.—Annual meeting, October 16 to 18, 1912. Marlborough-Blenheim Hotel, Atlantic City, N. J. Officers: President, Ira C. Copley, Aurora, Ills. Secretary, Geo. G. Ramsdell, 29 West 39th st., N. Y. City.

Canadian Gas Association.—Annual meeting Sept. 1913. Officers: President, Arthur Hewitt, Toronto, Ont.; Secretary and Treasurer, John Keillor, Hamilton, Ont.

Empire State Gas and Electric Association.—Annual meeting, New York City, Oct. 9, 1912. Officers: President, R. M. Searle, Rochester, N. Y.; Secretary, C. H. B. Chapin, 29 W. 39th street. New York City.

Gas Meters.—Next meeting, Oct. 10. Chairman, Will W. Barnes; Commissioners, W. H. Pettes, I. W. Peffly; Secretary, H. Thurston Owens, 42 Pine street, New York City.

Guild of Gas Managers of New England.—Annual meeting, March, 1913. Young's Hotel, Boston; monthly meeting, second Saturday. Officers: President, Walter G. Africa, Manchester, N. H.; Secretary, H. K. Morrison, Brockton, Mass.

Illinois Gas Association.—Annual meeting, March 19th and 20th, 1913. Chicago, Ills. Officers: President, H. O. Channon, Quincy, Ills.; Secretary-Treasurer, Horace H. Clark, 115 No. Oak Park avenue, Oak Park, Ills.

Illuminating Engineering Society.—Annual meeting,———— September, 1913. Meetings of Sections, monthly. Pres., V. R. Lansingh, Cleveland, O.; Sec., Preston S. Millar, 29 W. 39th street, New York City. Sections: New York, Secretary, C. L. Law, 124 West 42d street. New England, Secretary, H. C. Jones, 10 High street, Boston, Mass. Philadelphia, Secretary, L. B. Eichengreen, Broad and Arch streets. Chicago, Secretary, J. B. Jackson, 28 North Market street. Pittsburgh, Secretary, J. C. Mundo, Oliver Building.)

Indiana Gas Association.—Annual meeting, March, 1913, Indianapolis. Officers: President, Howard L. Olds, Indianapolis; Vice-President, Wm. Wallace, Lafayette; Secretary-Treasurer, Philmer Eves, Indianapolis.

Iowa District Gas Association.—Annual meeting, Burlington, Ia., May 22, 23, 24, 1913; Officers: President, C. W. Fair, Atlantic, Ia.; Secretary, G. I. Vincent, Des Moines, Ia.

Kansas Gas, Water and Electric Light Association.—Annual meeting, October 17-19. Manhattan, Kas. Officers: President, B. F. Eyer, Manhattan, Kas.; Secretary and Treasurer, J. D. Nicholson, Newton, Kas.

Michigan Gas Association—Annual meeting, September——1913;———— Officers: President, W. S. Blauvelt, Detroit, Mich; Secretary-Treasurer, Glenn R. Chamberlain, Grand Rapids, Mich.

Missouri Electric Light, Gas, Water Works and Street Railway Association.—Annual meeting, April, 1913; Joplin, Mo. Officers: President, P. A. Bertrand, Joplin, Mo.; Secretary and Treasurer, P. W. Markham, Brookfield, Mo.

National Commercial Gas Association.—Annual meeting and Gas Show, Dec. 2-5, 1912. Atlanta, Ga. Officers: President, C. L. Holman, St. Louis, Mo.; Secretary, Louis Stotz, 29 West 39th street, New York City.

Natural Gas Association.—Annual meeting, Cleveland, O., May, 1913; Officers: President, M. B. Daly, Cleveland, O; Secretary, T. C. Jones, Delaware, O.

New England Gas Association.—Annual meeting, February,————1913 Boston. Officers: President, D. D Barnum, Worcester, Mass.; Secretary-Treasurer, N. W. Gifford, East Boston, Mass.

New Jersey State Gas Association.—Winter Meeting, December——, Newark N. J.—President, William H. Pettes, Newark, N. J.; Secretary-Treasurer, Arthur H. Osborn Belmar, N. J.

Ohio Gas Association.—Annual meeting, February ———, 1913, Columbus, O.; President, John M. Garard, Columbus, O.; Secretary, L. B. Denning, Columbus, O.

Oklahoma Gas, Electric and Railway Association.—Annual meeting, May, 1913. President, Noel R. Gascho, Alva, Okla.; Secretary, H. V. Bozell, Norman, Okla.

Pacific Coast Gas Association.—Annual meeting,———— September ——— 1913. Officers: President, Henry E. Adams, Stockton, Cal.; Secretary-Treasurer, John A. Britton, 445 Sutter street, San Francisco, Cal.

Pennsylvania Gas Association.—Annual meeting, York, Pa., April, 1913; Officers, President, H. H. Ganser, Norristown, Pa.; Secretary-Treasurer, W. O. Lamson, Jr., West Chester, Pa.

Society of Gas Lighting.—Annual meeting Dec., 13, 1912; monthly meetings, second Thursday. Place, New York City. Officers: President, Fred. S. Benson; Secretary, George G. Ramsdell, 29 West 39th street, New York city

Southern Gas Association.—Annual meeting, Charlotte, N. C., April——— 1913, Officers: President, C. E. White, Montgomery, Ala.; Secretary-Treasurer, E. D. Brewer, Atlanta, Ga.

Southwestern Electrical and Gas Association.—Annual meeting. April————1913, Galveston, Tex. Officers: President, F. M. Lege, Jr., Galveston, Tex.; Secretary, H. S. Cooper, 405 Slaughter Bldg., Dallas, Tex.

Wisconsin Gas Association.—Annual meeting, May ———— 1913, Milwaukee, Wis. Officers: President, I. F. Wortendyke, Janesville, Wis.; Secretary-Treasurer, Henry Harmon, Milwaukee, Wis.